QST

March 1954
40 Cents
45c in Canada

devoted entirely to

amateur radio

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

NEW "M" TYPE TOROIDS Maximum Q Minimum Size

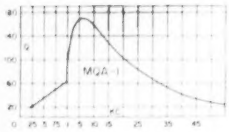
UTC Permalloy Dust Toroids have been the standard of the industry for over 15 years. The MQ series of coils provide the highest Q factor in their class (see curves below), with miniaturized dimensions. All units are hermetically sealed to MIL-T-27 Specifications.

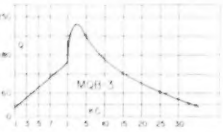
The stability is excellent. For the MQE-7 the inductance change is less than 1% for voltages from .1 to 3 volts. The MQA-13 change is less than 1% for applied voltages from .1 to 20 volts. The MQB-5 change is less than 1% for applied voltages from .1 to 50 volts. DC is permissible through the coil (values listed below). Inductance is virtually independent of frequency temperature and vibration.

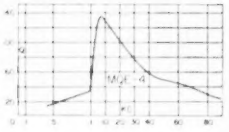
Hum pickup is extremely low due to the toroidal winding structure, with windings uniformly spread over the core. The case is of high permeability, offering additional shielding such that close spacing of units can be effected, the coupling attenuation being approximately 80 DB.

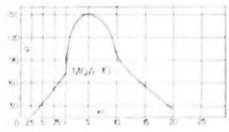
Other values of inductances than those listed are available on special order at the price of the next higher listed value.

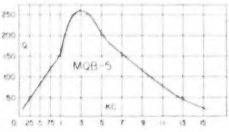
TYPICAL Q CURVES

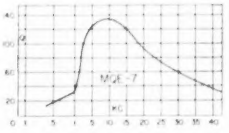


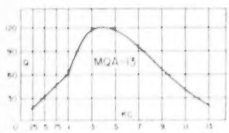


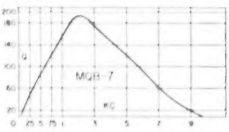


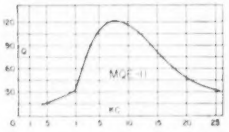


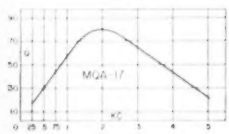


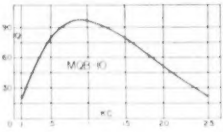


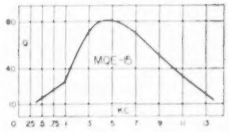












MQA TYPES

Type No.	Inductance	*DC Max.
MQA-1	7 mhy.	250
MQA-2	12 mhy.	200
MQA-3	20 mhy.	150
MQA-4	30 mhy.	125
MQA-5	50 mhy.	100
MQA-6	70 mhy.	80
MQA-7	120 mhy.	60
MQA-8	.2 hy.	50
MQA-9	.3 hy.	40
MQA-10	.5 hy.	30
MQA-11	.7 hy.	25
MQA-12	1 hy.	20
MQA-13	1.5 hy.	17
MQA-14	2.5 hy.	13
MQA-15	4 hy.	10
MQA-16	6 hy.	9
MQA-17	10 hy.	7
MQA-18	15 hy.	5
MQA-19	22 hy.	4

MQB TYPES

Type No.	Inductance	*DC Max.
MQB-1	10 mhy.	400
MQB-2	30 mhy.	250
MQB-3	70 mhy.	170
MQB-4	120 mhy.	120
MQB-5	.5 hy.	60
MQB-6	1 hy.	40
MQB-7	2 hy.	30
MQB-8	3.5 hy.	22
MQB-9	7.5 hy.	16
MQB-10	12 hy.	11
MQB-11	18 hy.	9
MQB-12	25 hy.	8

MQE TYPES

Type No.	Inductance	*DC Max.
MQE-1	7 mhy.	135
MQE-2	12 mhy.	100
MQE-3	20 mhy.	80
MQE-4	30 mhy.	65
MQE-5	50 mhy.	50
MQE-6	70 mhy.	40
MQE-7	100 mhy.	35
MQE-8	150 mhy.	30
MQE-9	.25 hy.	22
MQE-10	.4 hy.	17
MQE-11	.6 hy.	14
MQE-12	.9 hy.	12
MQE-13	1.5 hy.	9
MQE-14	2 hy.	8
MQE-15	2.8 hy.	7.2

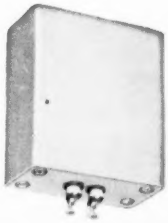
*This value of D.C. (MA) will drop the coil inductance 5%. Values of D.C. below this will show proportionately (linear) less inductance drop. For example, MQE-1 will drop 1/2% in L with 13.5 MA.

MQE CASE

Length ..... 1 1/16"
Width ..... 1/2"
Height ..... 17/32"
Unit Weight ..... 1.5 oz.

MQA CASE

Length ..... 1 9/32"
Width ..... 11/16"
Height ..... 1 23/32"
Unit Weight ..... 4 oz.



MQB CASE

Length ..... 2 9/16"
Width ..... 1 13/16"
Height ..... 2 13/16"
Unit Weight ..... 14 oz.

United Transformer Co.
150 VARICK STREET • NEW YORK 13, N. Y.
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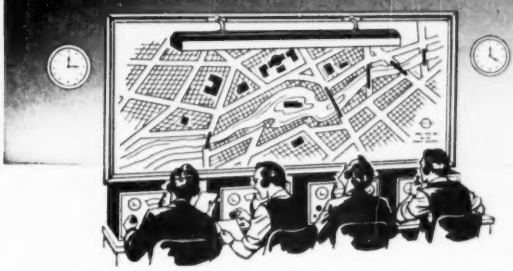
For dependable CD work
....G-E 5-STAR TUBES!



AT NEW LOW PRICES!

They're down as much as 50% and more from the original figures! Large-scale output has brought about substantial production savings . . . which G.E. is passing on to you in the form of plus-value prices. See your nearby G-E tube distributor!

You can't afford failures when handling civil defense. Help avoid them with 5-Star Tubes!

DESIGNED FOR RELIABILITY! Double mica spacers, doubled-staked getters, welded tab stops . . . these are three of the many special features *designed into* G-E 5-Star Tubes, so they will resist shocks and vibration.

BUILT FOR RELIABILITY! 5-Star Tube parts are individually inspected and micro-measured. Among many advanced steps in manufacture, is a special coating process on heater bends that virtually eliminates heater failures.

TESTED FOR RELIABILITY! Every G-E 5-Star Tube gets a 46-hour "burn-in" under Class A conditions. When you install a 5-Star Tube, you know it will do its job, and keep doing it!

Twelve popular types are given at right. The complete 5-Star Tube list, including subminiatures, is available at your G-E tube distributor's. Visit him today! *Tube Dept., General Electric Co., Schenectady 5, N. Y.*

● General Electric wishes to congratulate the winner of the 1953 Edison Award, J. S. Surber, W9NZZ, Peru, Indiana. For sacrificing hours of his time day-in and day-out to keep remote arctic weather station men in touch with their families, Mr. Surber was adjudged the amateur whose public service was the most noteworthy. Radio amateurs everywhere can feel honored by this tribute to a member of their group.

Here are 12 types you will find directly useful!

STANDARD TUBES	REPLACE WITH THESE 5-STAR HIGH-RELIABILITY TUBES
5Y3-GT	*GL-6087—full-wave rectifier.
6AK5	GL-5654—sharp-cutoff r-f pentode.
6AL5	GL-5726—twin diode.
6AQ5	GL-6005—beam power amplifier.
6AU6	GL-6136—sharp-cutoff r-f pentode.
6BA6	GL-5749—remote-cutoff r-f pentode.
6BE6	GL-5750—pentagrid converter.
6C4	*GL-6135—medium-mu triode.
6SK7	GL-6137—remote-cutoff r-f pentode.
6X4	*GL-6202—full-wave rectifier.
12AT7	GL-6201—h-f high-mu twin triode.
12AY7	*GL-6072—low-noise high-mu twin triode.

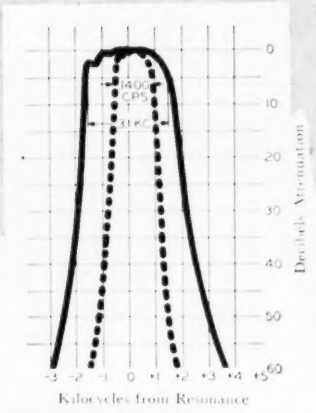
**Slight electrical difference.*

GENERAL ELECTRIC

166-182

Sooner or later you'll want

A COLLINS RECEIVER



Collins 75A-3 Receiver with Mechanical Filter

The Collins 75A-3 double conversion superheterodyne receiver, with its crystal-controlled front-end and highly stable low frequency VFO, is like a high frequency crystal-controlled converter working into a very stable low frequency receiver. The high stability and 3.1 kc bandwidth of the 75A-3 make it ideal for AM or single sideband — and an 800 cycle mechanical filter is available as an optional accessory for CW.

All coils are permeability tuned and have a straight-line frequency characteristic allowing linear dial calibration. Only the band in use is visible on the slide rule dial. On the vernier dial each division represents one kc except on the 10 and 11 meter bands, where each dial division represents two kc. This accurate calibration is made possible by the highly stable oscillators in the 75A-3.

The 75A-3 covers the 160, 80, 40, 20, 15, 11, and 10 meter amateur bands. Sensitivity on all bands is 2.5 mv or better for a 10 db signal-to-noise ratio. Image rejection is at least 50 db. AVC is applied to RF as well as IF stages. Separate noise limiters for phone and CW. The S-meter is calibrated from 1 to 9 in steps of approximately 6 db, and for 20, 40 and 60 db over S9. S9 corresponds to a signal input of 100 microvolts. Antenna input impedance is 50 to 150 ohms, balanced or unbalanced. A phone jack and 4 ohm and 500 ohm audio output terminals are provided. Sockets and front-panel controls are included for the 8R-1 100 kc crystal calibrator and 148C-1 NBFM adapter which are available as optional accessories. The following controls are on the 75A-3 front panel: tuning, zero set, bandswitch, RF gain, audio gain, BFO pitch, CW limiter, antenna trimmer, crystal selectivity, crystal phasing, mechanical filter selector, CW-AM-FM switch, noise-limiter calibrate switch, on-off-standby switch. The 75A-3 operates from a 115 volt 50/60 cycle ac power source. Cabinet dimensions are: 21¼" wide, 12¼" high, and 13 1/16" deep. The 19" panel fits a standard relay rack. The 75A-3 weighs approximately 50 pounds.

Net domestic prices:

75A-3 receiver complete with F455B-31 3 kc mechanical filter:	$530.00
10-inch speaker in matching cabinet:	$20.00
8R-1 crystal calibrator:	$25.00
148C-1 NBFM adaptor:	$22.50
F455B-08 . . . 800 cycle mechanical filter:	$55.00
F455B-60 . . . 6.0 kc mechanical filter:	$55.00

See Your Collins Distributor Today

For the best in amateur radio . . .

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Cedar Rapids, Iowa

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1930 Hi-Line Drive, DALLAS 2
2700 W. Olive Avenue, BURBANK

COLLINS

QST

MARCH 1954

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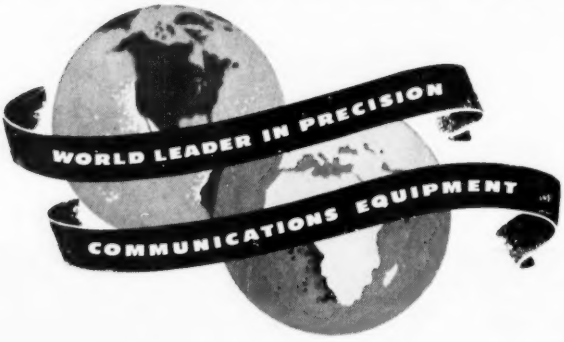
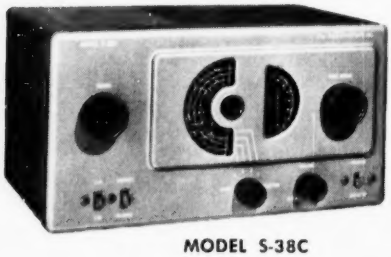
hallicrafters



MODEL S-53A



MODEL S-38C

MODEL S-76

MODEL S-40B

Here are the high performance—high value instruments that have made the hallicrafters name best known among amateurs around the world!

As an amateur operator, you know there is no substitute for performance in a receiver. Either a rig pulls in the signals or it doesn't. That's why we urge you to compare Hallicrafters receivers—model for model and dollar for dollar—with *any* others on the market. We know that when you do you'll choose Hallicrafters—because comparisons like that are what have built our business and reputation. A reputation backed by expert operators all over the world.

MODEL S-38C. The radio that amazes even the experts! Offers world-wide reception for the short-wave listener and the new radio amateur even in weak signal areas where ordinary sets fail. Covers Broadcast Band 540-1650 kc *plus three short-wave bands* covering 1650 kc-32 Mc.

Electrical band spread plus high gain circuitry makes tuning even on crowded bands a snap. Really pulls in distant, weak signals. Headfone tip jacks on rear and built-in PM speaker. Oscillator for reception of code signals.

Gray steel cabinet 12⅞" x 7" x 7¾" deep. Shipping weight 13 lbs. Four tubes plus rectifier. **$49.95**

MODEL S-53A. The finest small communications receiver built and ideal where maximum performance is required in small space. Several steps better than the S-38C, but not quite up to larger S-40B. Covers Broadcast Band 540-1630 kc *plus four short-wave bands* covering 2.5-31 and 48-54.5 Mc.

Electrical bandspread tuning control to separate stations on crowded bands, with calibration for 48-54.5 Mc. Two i-f stages. Panel switches control automatic noise limiter, code reception and high-low control. Phono jack for records. Headfone tip jacks on rear and built-in PM speaker. Temp. compensated to reduce fading due to frequency shift.

Satin black steel cabinet with brushed chrome trim. 12⅞" x 7" x 7¾" deep. Shipping weight 19 lbs. Piano hinge top. Seven tubes plus rectifier. **$99.95**

MODEL S-40B. Long a favorite with amateurs. A big set with big set performance at a modest price. The largest set in the Hallicrafters line, with its own built-in speaker. Covers Broadcast Band 540-1680 kc *plus three short-wave bands* covering 1680 kc-44 Mc.

Electrical bandspread tuning control to separate stations on crowded bands. One r-f, two i-f stages to draw in stations. Switches for automatic noise limiter, code reception and three position tone control. Code pitch control and built-in speaker.

Satin black steel cabinet. 18½" x 8⅞" x 9½" deep. Shipping weight 36 lbs. Piano hinge top. Seven tubes plus rectifier. **$119.95**

MODEL S-76. Value packed, double conversion communications receiver with Broadcast Band 538-1580 kc *plus three short-wave bands* covering 1720 kc-34 Mc.

Electrical bandspread tuning control with calibrated dial to separate stations on crowded bands. Double superhet with 50 kc second i-f and giant 4-inch "S" meter. Five position selectivity, one r-f, two conversion, two i-f stages, temperature compensated. Phono input jack. 3.2 or 500 ohm outputs. Socket for external power or remote control.

Satin black steel cabinet with chrome plastic trim rings. 18½" x 8⅞" x 9½" deep. Shipping weight 41 lbs. Piano hinge top. Nine tubes plus voltage regulator and rectifier. **$199.95**

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THE NAME IS FAMOUS — RADIO · TELEVISION · HIGH FIDELITY

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to qualified League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist, SCMs desire applications for SEC, EC, RM and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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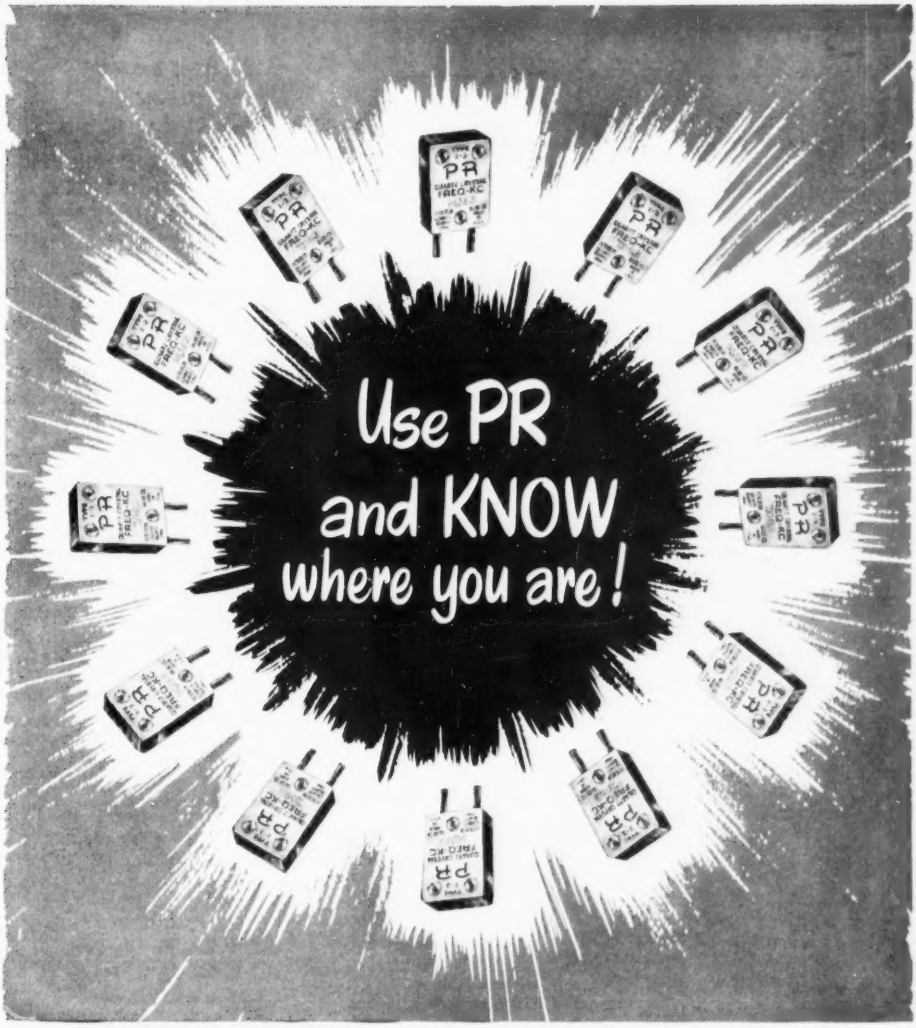

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THE AMERICAN RADIO RELAY LEAGUE, *INC.*,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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"It Seems to Us..."

NON-AMATEUR INTERFERENCE IN HAM BANDS

We continue to receive complaints about non-amateur operation in our bands in just about the same proportion as varying propagation conditions permit these signals from other countries to come boiling into our receivers; we think it might be well to review again some of the background of this subject and its international regulatory complexities.

First point: U. S. hams should realize that our low-frequency bands are by no means all allocated to the amateur service on a *world-wide* basis. For example, "our" 80-meter band has never at any time been exclusively amateur throughout the world; it can be said that only the record of amateur operation in the public interest, convenience and necessity has caused our own Government to maintain a policy of making the full 500 kc. available exclusively to amateurs in this country. But in Europe, the band has always been shared between amateur, fixed and mobile between 3500 and 3800 kc. — and above that amateurs aren't permitted, the frequencies being used by fixed, mobile and even broadcasting, all quite legitimately. With present optimum propagation conditions, we hear quite a number of stations identifiable as European — and therefore not violating international treaty. The situation is generally similar in other parts of the world outside the Americas.

And yet, while for many years the countries of North and South America at periodic regional meetings were able to come to agreement (on paper, at least) that the 80-meter band would be exclusively amateur in this hemisphere, even that solidarity has now been broken.[1] In many Latin countries, amateurs simply don't make use of the frequencies, sometimes because of interest in DX only, more often because of high noise levels. In any event, there is little or no support of the full amateur allocation. Further, the economic situation of those mountainous areas is such that it is far more practicable to set up a couple of 100-watt fixed low-frequency stations to provide a communications circuit than to hack a path through the terrain and construct a thousand-mile landline. This is precisely what has been going on for many years, although the low power and mediocre propagation conditions in the past have kept the stations out of our hair for the most part. But now, with a real shortage of frequencies, Latin nations have been forced more and more to use "our" band; at the Washington 1949 conference, unanimous agreement simply could not be obtained for an exclusive amateur band and a number of countries (many of whom were officially represented by delegates who were also amateurs) simply had to face the hard facts of life and take reservations to the majority agreement. This keeps them from being bound to observe the band as allocated to amateurs, and their commercial and government operation is not challengeable on an international basis. In these matters we have little choice at present but to battle the interference as best we can, and hope the sunspot cycle will turn upwards quickly in a year or so.

Forty meters is the same story in principle, but differs in detail. Until 1938 the full 300 kc. was exclusively amateur throughout the world. But that year at the Cairo conference the two opposing philosophies about the relative merits of amateur operation compared with other services ran smack into each other; U.S.A., Canada and most South American nations held out for an exclusively amateur allocation, but in the rest of the world the proponents of propaganda broadcasting insisted that the band be split, amateurs and broadcasting. Faced with this dilemma, the conference made the only practical agreement possible — each hemisphere went its own way. Atlantic City in 1947 found the same problem, and adopted the same solution, except more so. So while the full 300 kc. is exclusively amateur on this side of the world, in much of the rest of the globe the top two-thirds of the band is available for broadcasting. You've heard plenty, of course; most of the propaganda is beamed to parts of the world other than the U.S.A., but the extra kilowatts of power used produce a healthy signal even off the sides and backs of the radiating systems.

As for the lower portion, when you hear 'phone signals they're probably Latin amateurs; to the south of us, because of the predominantly greater interest in voice, larger portions of the bands are available for that mode of emission. Each nation has the right

[1] Budlong, "The Fourth Inter-American – Region 2 Radio Conference," *QST*, September, 1949, page 35.

to whack up its amateur bands between various modes of emission as it chooses, and we wouldn't think of telling Brazil, for example, what its 'phone-c.w. assignments should be any more than we would take kindly to a suggestion by them as to what ours should be.

Twenty meters is exclusively amateur around the world, with a small exception in Russia; fifteen and ten meters are exclusively amateur, although there will be non-amateur stations heard occasionally on 21 Mc. until the present complex process of shifting frequencies to meet the Atlantic City table is completed.

None of this discussion is intended to suggest that amateurs should cease alert reporting to Hq. of non-amateur operation in our bands; it is simply a general explanation of why, in many cases, a number of the non-amateur stations heard in our U. S. amateur bands are there quite legitimately from the international standpoint.

FCC Visits ARRL Hq.

On January 18th, League headquarters was signally honored by the visit of five members of the Federal Communications Commission plus two executive staff heads. Those who made the journey from Washington to become better acquainted with activities of the national amateur association were Chairman Rosel H. Hyde, Commissioner Frieda B. Hennock, Commissioner George E. Sterling (W3DF), Commissioner Edward M. Webster and Commissioner Robert T. Bartley, plus Col. Edwin L. White, chief of the Safety & Special Radio Services Bureau (parent bureau for the amateur division), and George S. Turner (W3AP), chief of the Field Engineering and Monitoring Bureau, which as most amateurs know conducts license examinations and has responsibility for monitoring and interference problems.

In recent years a number of Commissioners, notably Mr. Sterling, had indicated a desire to visit the Hq. plant in a body, but it was only this year that things worked out to make it a reality. A formal invitation was tendered by President Dosland, who then came east to welcome our distinguished visitors personally. Commissioners John C. Doerfer and Robert E. Lee were unable to attend because of previous commitments, but sent their regrets. Mr. Doerfer had a speaking engagement; Mr. Lee was that day scheduled to appear before a Senate committee concerning confirmation of his appointment, which we are happy to note was shortly forthcoming.

It was a busy day, starting off with breakfast at which President Dosland and General Manager Budlong were hosts. The morning was spent at the headquarters office on 38 La Salle Road, West Hartford, seeing at first hand the varied service and business activities conducted by our staff of 60 employees. There was a roundtable discussion of League affairs; although the subject was, to say the least, not unfamiliar to several of our visitors, full advantage was taken of the opportunity to outline the structure of the League, its history in amateur affairs, and the many services it provides amateur radio. Something over an hour was then utilized in our laboratory in a demonstration and discussion of television interference problems, including those involved in dual-conversion channel-strip tuners for u.h.f., using lab gear and portions of the now-famous "TVI show."

OUR COVER

Setting: Corner of ARRL lab
Audience: Distinguished visitors from FCC
Speaker: W1DF
Subject: U.h.f. strip TVI

At noontime, League department heads joined the visitors in an informal, leisurely luncheon, where much of the discussion continued. The remainder of the afternoon until train time was occupied with an inspection of the Maxim Memorial Station, W1AW, in Newington. There, with W3DF at the controls, our visitors had the opportunity to speak over the mike of an amateur station — most of them for the first time, although we must say they performed like old hands at the game.

All in all it was a very pleasant day, and we are certain the Commissioners would join us in saying that we wish there had been even more time available for visiting. We hope they will come back again soon!

Top: FCCommissioners and staff members become absorbed in a demonstration by ARRL Technical Director George Grammer of some of the problems in dual-conversion strip tuner TV receiver installations for u.h.f. reception. *Front, l. to r.,* Safety & Special Radio Services Bureau Chief Edwin L. White, Commissioner Robert T. Bartley, Commissioner George E. Sterling (W3DF), Chairman Rosel H. Hyde, Commissioner Frieda B. Hennock; *rear,* Commissioner Edward M. Webster, ARRL General Manager A. L. Budlong, President Goodwin L. Dosland, and Field Engineering & Monitoring Bureau Chief George S. Turner (W3AP).

☆

Center: President Dosland, at far left, watches while General Manager Budlong points out to Chairman Hyde and Commissioner Hennock the original Wouff-Hong in the ARRL Secretary's office.

☆

Bottom: We'll wager that the afternoon of January 18th was the highlight of a long ham career for W2DUR, who answered W1AW's 75-meter 'phone CQ and found himself talking first with Commissioner Sterling, W3DF, and later with practically the whole FCC! Observing the initial contact here are President Dosland, Chairman Hyde, Commissioners Webster and Bartley, Col. White, A. L. Budlong (in background) and George Turner.

March 1954

Delay-Line Phase Shift

A New Application for S.S.B. Transmitters

BY DANA A. GRIFFIN,* W2AOE, AND DONALD H. FRYKLUND,* W2HLP

• R.f. delay lines have been with us for a number of years, but heretofore amateur applications have been lacking. Here is one that should interest the operators of phasing-type s.s.b. rigs.

Although this is a description of a new idea rather than a "how-to-build-it," the transmitter in which the delay-line technique is incorporated has other useful features that can easily be applied to existing outfits. They are described in the article.

THE verbal battle over the virtues of crystal-filter single-sideband transmitters as opposed to the phasing type probably will never end. The filter method has the advantage of requiring little or no adjustment for operation over a given band. Its disadvantages are: first, two oscillators are required, increasing the frequency stability problem; second, it is relatively difficult to shift from one band to another; third, the unwanted "birdie" frequencies that are the products of frequency conversion can cause serious trouble if they get out on the air.

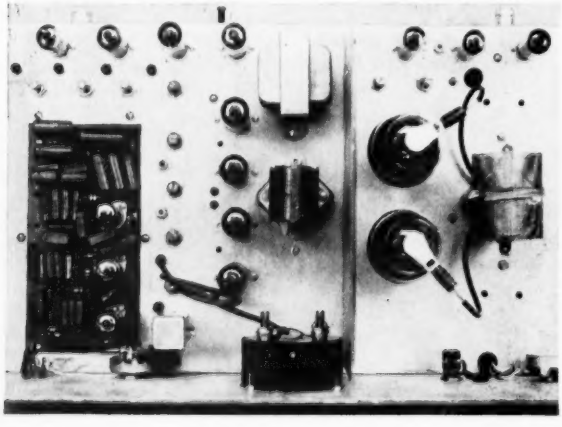
Transmitters using the phasing system require readjustment of the r.f. phasing if the frequency of transmission is changed over any appreciable range. A currently popular way to get around this trouble is to operate the balanced modulator at a fixed frequency and use conversion techniques. The same troubles that arise with frequency conversion in the crystal filter system then occur. A simple method of adjusting the r.f. phase shift to 90 degrees at any frequency in a band ordinarily used for single-sideband transmission would go far toward overcoming the frequency-changing difficulty.

The r.f. delay line offers a means of operating with a VFO without the use of another oscillator and mixer, since the 90-degree r.f. phase relationship between the two r.f. channels can be maintained by a single, simple adjustment over a relatively large band of frequencies. The adjustment of a single trimmer capacitor which "tunes" the delay line in phase, just as tuning capacitors tune the transmitter to a given frequency, enables the operator to obtain a phase shift of 90 degrees in a matter of seconds at any frequency within a band of frequencies such as 75-meter 'phone band.

Although delay line has had practically no application in amateur communication, it is well known in commercial circles, particularly in connection with pulse work. Essentially, it is simply a transmission line in which, by special construction, the velocity of propagation has been made very low so that a section of line that is quite short, physically, will have a comparatively large electrical length. Since the phase of the voltages at the input and output ends of a line is a direct function of the electrical line length, any phase relationship desired can be obtained by using the proper length of line. A 90-degree phase shift will result when the line is exactly one-quarter wavelength long.

Fig. 1 shows the basic circuit and vector diagrams of (above) a representative system of phase shift in common use and (below) the new system. The variable resistor in the delay line

* % Communication Measurements Laboratory, Inc., 350 Leland Ave., Plainfield, N. J.



A view of the transmitter using the delay-line r.f. phasing method described in the text. Other useful features of interest to single-sideband operators are incorporated in this unit, and discussed in the article. The balanced modulator tubes and circuits are in the center and the delay line is in the small shield can near the switch on the panel at the lower left.

system is used to equalize the voltages applied to the two balanced modulators. The resistor at the end of the delay line terminates the line at its characteristic impedance. The small trimmer capacitor is the panel adjustment which enables the operator to adjust the r.f. phase shift to 90 degrees at the desired operating frequency within a band. The physical length of the line changes for every band, being longest for 160 meters. Delay lines of the proper length for each band can be plugged into the circuit in the same manner as plug-in coils in r.f. tuned circuits.

Delay-Line Characteristics

The distributed-inductance type delay line used here was developed by GE and is currently being manufactured by Millen. A fine wire is wound on a piece of Saran tubing. This is covered with a wrapping of Teflon tape. A braided shield composed of Formex insulated wires is woven over the tape and a final serving of cotton is wrapped over the copper braid. The dimensions of the various elements determine the characteristic impedance of the line and the amount of delay for a given line length. The line we use has an impedance of 1350 ohms and provides a delay of approximately 250 millimicroseconds in a 6-inch length.

The time delay corresponding to a 90-degree phase shift for a given frequency is given by:

$$T = \frac{10^3}{4f} \text{ millimicroseconds}$$

where f is in megacycles. It is known that in the 4-Mc. region capacity loading of a delay line of this type causes a time-delay change of 1 millimicrosecond per micromicrofarad of capacity. As the 80-meter band runs from 3.5 to 4 Mc., the corresponding time delay range to maintain a 90-degree phase shift is

$$\frac{10^3}{4 \times 3.5} \text{ to } \frac{10^3}{4 \times 4} \text{ millimicroseconds,}$$

or 71.4 to 62.5 millimicroseconds. Hence, a 15-$\mu\mu$f. trimmer across the end of the delay line is more than adequate to provide the 9-millimicrosecond time-delay change needed to cover the band. The higher bands require a much smaller amount of capacity change to effect the necessary change in delay to maintain the 90-degree phase shift as the frequency is changed.[1]

Fig. 3 is the circuit diagram of a practical r.f. phase-shift network using delay line in conjunction with the usual pair of balanced modulators. This circuit is used in the s.s.b. transmitter shown in the photograph, and while no doubt many variations are possible the circuit as given is representative. The "A" and "B" audio inputs to the balanced modulators should, of course, be 90 degrees out of phase, and may be obtained from any of the a.f. phasing arrangements described in the literature.

On 75 meters, a VFO output of approximately 10 volts across 675 ohms (0.15 watt) is required to drive the network and balanced modulators shown in Fig. 3. This voltage is applied directly to the delay line and to a resistive divider circuit consisting of R_5 and the associated 1300-ohm resistor, thus providing the necessary quadrature r.f. drive for the balanced modulators. C_2 is the capacitive load on the delay line for adjusting the r.f. phase shift. R_6 and R_7 are balance controls used to equalize the grid No. 2 transconductances of the 6BA7 modulators by varying the relative grid-leak bias on each tube. In the transmitter shown, the balanced modulators drive a pair of 807s in push-pull as a linear r.f. amplifier. This stage is normally operated Class AB_1.

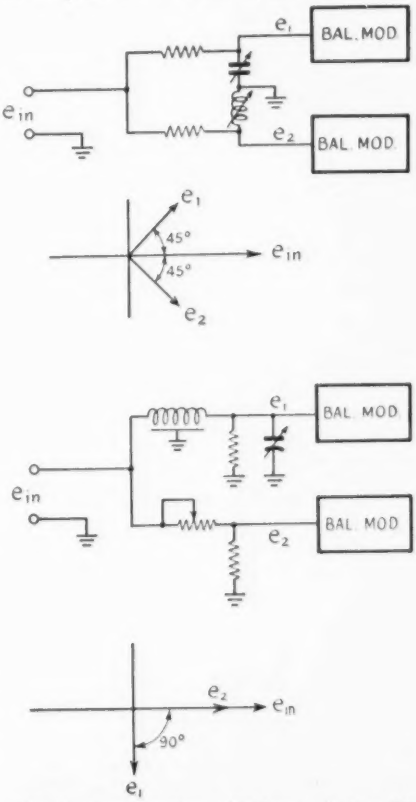


Fig. 1 — A common form of 90-degree r.f. phase shift network (*top*) and the corresponding delay-line circuit to give the requisite quarter-cycle interval in timing. In the delay-line case the amplitudes are balanced by means of the variable resistor.

Adjustment and Testing

Although the r.f. phasing adjustment is a single control, some means has to be provided

[1] The adjustment of the length of a delay line to provide a 90-degree r.f. phase shift is beyond the means of most amateurs because a fairly elaborate testing set-up is required. It is intended that properly adjusted lines for the several bands will be made available in plug-in cans so that the proper line can be plugged in when the transmitter is shifted from one band to another.

to give a quick indication of the proper setting after a frequency change. An ordinary communications receiver with a crystal filter offers a ready means of checking and obviates the necessity for any special test equipment such as an oscilloscope, although, of course, the 'scope can be used if available. Whatever the checking device used, an audio oscillator of good waveform is needed so that single-tone modulation will be available.

A fixed-frequency oscillator is sufficient, and in this transmitter provision is made for such an oscillator in the speech amplifier-voice control circuits shown in Fig. 2. Using an *RC* network that can be switched in and out as desired, the first speech amplifier stage can be converted into a 1500-cycle audio oscillator.

The crystal-filter receiver method of adjusting a phasing transmitter for best sideband suppression is probably known to most operators of such rigs, but for the benefit of those who may not be familiar with it, it is as follows:

Assuming that the audio phasing system is in proper adjustment and that the modulators have been balanced for maximum carrier suppression, a single tone is applied to the audio system giving what, in a perfectly-operating set-up, would be single-frequency r.f. output — that is, a pure c.w. signal. The receiver's crystal filter is set in its sharpest position and the signal is tuned in for maximum S-meter reading. The sideband reversing switch is then thrown to the other sideband, upon which the S-meter reading should decrease considerably. The receiver's crystal-filter phasing control is then adjusted for minimum S-meter reading (to phase out the "desired" signal, which is now in the other sideband). Keeping the receiver on tune at the original frequency, the r.f. phasing control on the transmitter (C_2 in Fig. 3) is now adjusted for minimum S-meter reading, and on returning the sideband reversing switch to its first position the transmitter is ready for use.

Usually, enough signal will be heard from the output circuit of the balanced modulators alone to permit making the adjustment without actually putting the transmitter on the air. As an alternative method, the receiver's a.v.c. can be switched off and the beat-frequency oscillator turned on and the same procedure followed by listening to the beat note instead of watching the S-meter. The r.f. gain control should be oper-

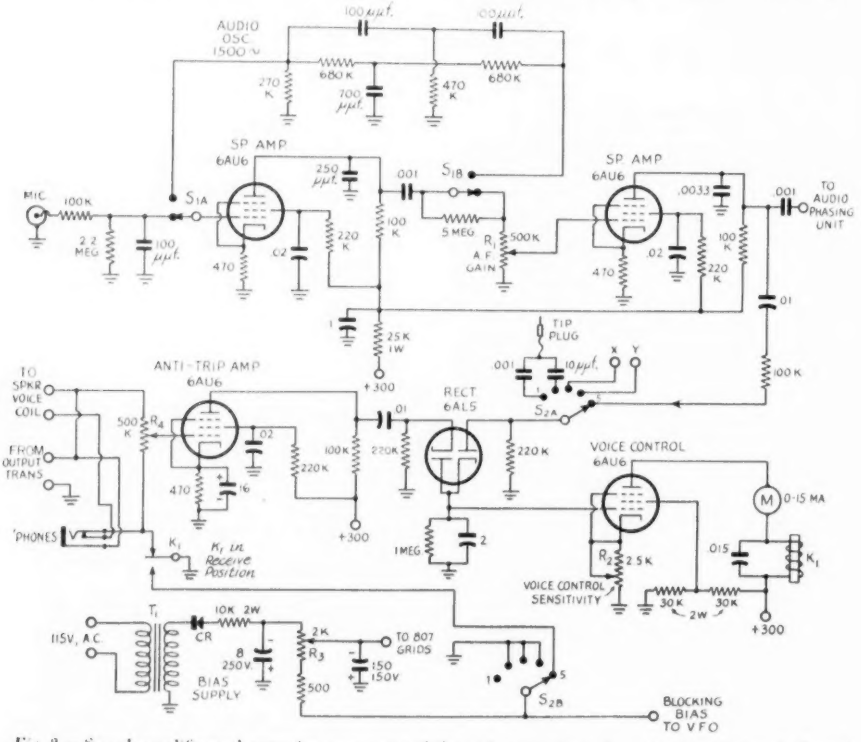


Fig. 2 — Speech amplifier and operating accessories of the s.s.b. transmitter shown in the photograph. Capacitance values are in μf. and resistors are ½ watt, unless otherwise indicated.

CR — Selenium rectifier.

K_1 — D.p.d.t. relay (one set of contacts used), 10,000-ohm coil.

T_1 — 1-to-1 transformer, 115 v.

See Fig. 3 for connection to X, Y goes to the final r.f. output link through a 2-μμf. coupling condenser.

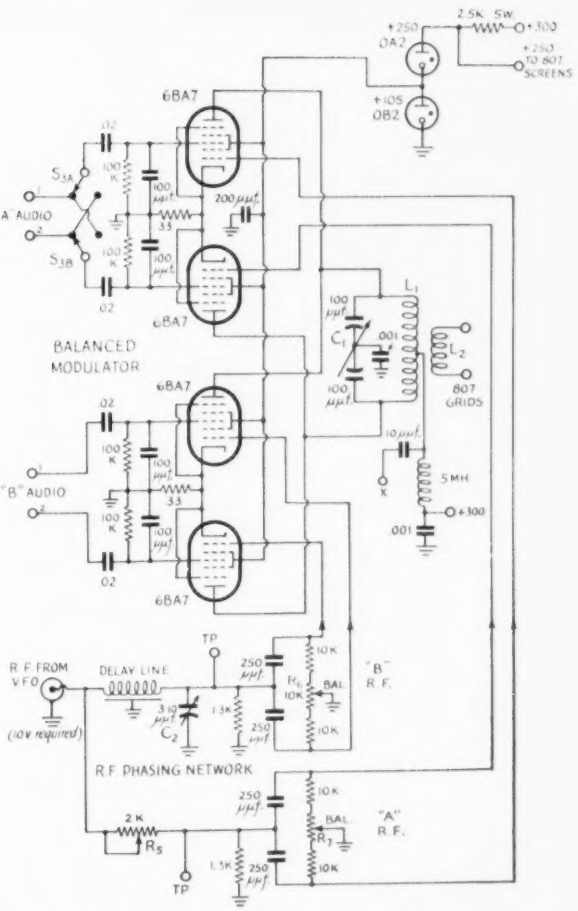


Fig. 3 — Balanced modulators and r.f. phasing network. Capacitance values are in μf. and resistors are ½ watt, unless otherwise indicated. The delay line is described in the text.

L_1 — 40 turns No. 18, 2 inches long, 1½-inch diam. (B & W type JCL with link removed).

L_2 — 40 turns No. 24 enam. close-wound on ⅞-inch form centered in L_1.

These values for 3.8- to 4-Mc. operation.

See Fig. 2 for connection to X. The switch in the grid circuits of the upper pair of 6BA7s is for reversing sidebands.

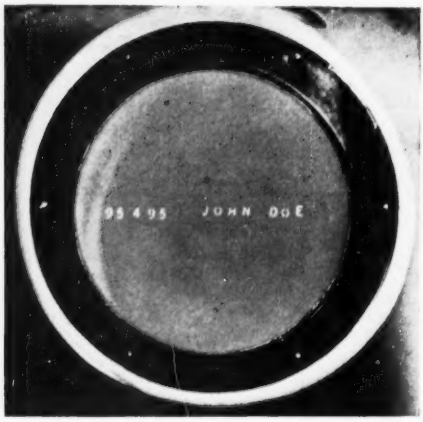
TP indicates a pin-jack test point.

ated below the point where the receiver overloads when the desired signal is tuned in, if a good aural estimate of the extent to which the sideband can be suppressed is to be obtained.

In addition to provision for converting the first speech stage to an audio oscillator, there are other features in Fig. 2 that we believe to be useful and of interest to s.s.b. operators. By means of S_2, the voice-control rectifier and amplifier can be used as a v.t. voltmeter for checking both a.f. and r.f. levels at various points in the transmitter. This is a distinct advantage both in initial adjustment of the transmitter and in monitoring its performance. With S_2 in the extreme left-hand position, a test prod is connected to the voice-control rectifier through a 0.001-μf. condenser for audio measurements. By the use of pin jacks installed at appropriate points, the a.f. voltages applied to the modulators can be balanced up. In the second position of S_2 a 10-μμf. condenser is connected between the probe and rectifier for balancing the r.f. voltages applied to the modulators at the test points shown in Fig. 3. In the third position, the rectifier is connected to point X in Fig. 3, where the circuit is used for checking carrier suppression, final adjustment for which is made by means of R_6 and R_7. The fourth position connects the rectifier to the output link of the linear amplifier through a condenser of a few μμf., where it serves as a level indicator. The fifth and final position connects the speech amplifier to the voice-control rectifier and is the normal operating position for S_2.

The audio gain and operating sensitivity for proper functioning of the voice-control circuit are controlled by R_1 and R_2, Fig. 2, respectively. The anti-trip sensitivity control, R_4, is adjusted for the minimum gain necessary to hold the transmitter off with normal output from the speaker.

The bias supply shown in Fig. 2 provides both operating bias for the 807s in the linear amplifier and, through the voice-control relay, blocking bias for the 807s and the VFO.



♦

• Can you imagine a black box that takes ordinary hand-sent c.w. signals and displays their translated message on a screen? Well, there is such a gadget, and some of its basic principles are disclosed in this article.

♦

The Application of the Charactron as a Morse Code Converter

Instantaneous Visual Display of Translated C.W. Signals

BY JOSEPH T. McNANEY* AND DONALD F. JACKSON**

THE Charactron C.W. Receiver converts Morse Code information into a visual display of printed characters on the fluorescent screen of a Charactron cathode ray tube. The code signals are received in a conventional manner, via radio or landlines. Letters, numerals, punctuation marks, etc., corresponding to the received codes, are printed in one or more lines across the screen of the tube. There are provisions for a total of 32 characters and spaces per line. The persistence of the phosphor will permit the viewing of complete words as the information is received, or the information may be recorded on film or other photographic media.

Messages may be received over a range of speeds comparable to that of hand-worked signals up to the higher-speed transmission rates of modern telegraph systems. The operational rates of the present equipment may vary between 10 and 80 words per minute. Upper speed limits, however, could be extended to several thousand words per minute, if necessary.

The Charactron method of Morse code reception has several distinct ad-

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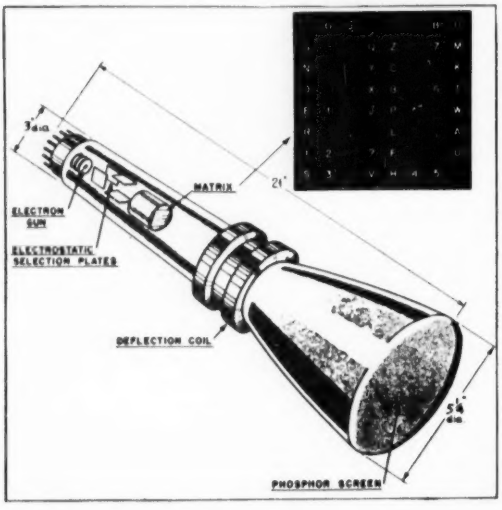


Fig. 1 — An artist's sketch of the Charactron tube, and (*upper right*) the stencil.

♦

MORSE TO BINARY CODE CHART

A	.–	101111	W	.––	100111
B	–...	011100	X	–..–	011011
C	–.–.	010100	Y	–.––	010011
D	–..	011000	Z	––..	001100
E	.	100000	1	.––––	100001
F	..–.	110100	2	..–––	110001
G	––.	001000	3	...––	111001
H	....	111100	4	....–	111101
I	..	110000	5	.....	111110
J	.–––	100011	6	–....	011110
K	–.–	010111	7	––...	001110
L	.–..	101100	8	–––..	000110
M	––	001111	9	––––.	000010
N	–.	010000	0	–––––	000001
O	–––	000111	,	––.–	101010
P	.––.	100100	*	.–.–.	101101
Q	––.–	001011	?	..––..	110011
R	.–.	101000	–	–....–	011101
S	...	111000	:	–.–.–.	010101
T	–	011111	'	.––––.	101110
U	..–	110111	.	.–.–.–	111010
V	...–	111011			

Fig. 2 — Morse to 6-element binary code chart.

vantages over the more conventional and oral means by virtue of its ability to print out the information in word and numeral forms. In doing so, reception of such signals is no longer limited to the skilled operator, regardless of transmission rates and particular quality of the message codes.

The Charactron cathode-ray tube that makes this possible is shown in diagram form in Fig. 1. This tube is unlike ordinary c.r. tubes in that it contains a stencil of character-shaped openings by which the cross-section of the electron beam is changed in accordance with that of predetermined letters or numerals. Illuminated characters of the independently-shaped electron beams are then positioned on the screen of the Charactron to form the words and sentences.

A stencil layout of characters is also shown in Fig. 1. This arrangement of character-shaped openings in the metal plate lends itself to the system of six-element binary codes shown in Fig. 2, which also includes the corresponding Morse codes and message characters with which they are identified. Although the present equipment was designed to convert Morse codes to letters and numerals of the English language, it could be made to convert such codes to other languages as well by merely employing a Charactron tube having matrix openings corresponding to characters of the desired language.

Circuitry

To convert the Morse code, a dash must be differentiated from a dot. Also, an element space, a character space, and a word space must be sensed as such. In the process of accomplishing this, the input code is routed into four main channels of circuitry that will be described in connection with the block diagram of Fig. 3. The first channel causes the advance of a chain of binary counters. These counters are advanced one count by a pulse produced by the leading edge of each code bit. Each binary counter, in turn, opens Gate 1 through 6 successively, and one at a time. The outputs of Gate 1 through 6 control the condition of a binary code memory block, *F.F.-1* through *F.F.-6*. The input signal to *G-1* through *G-6* is determined by *G-7*.

The input to *G-7* represents the second main channel. The input to *G-7* is pulses produced by the trailing edge of each code bit. Whether

The Charactron Receiver converts ordinary Morse code information into a visual display of characters that can be copied by a competent typist.

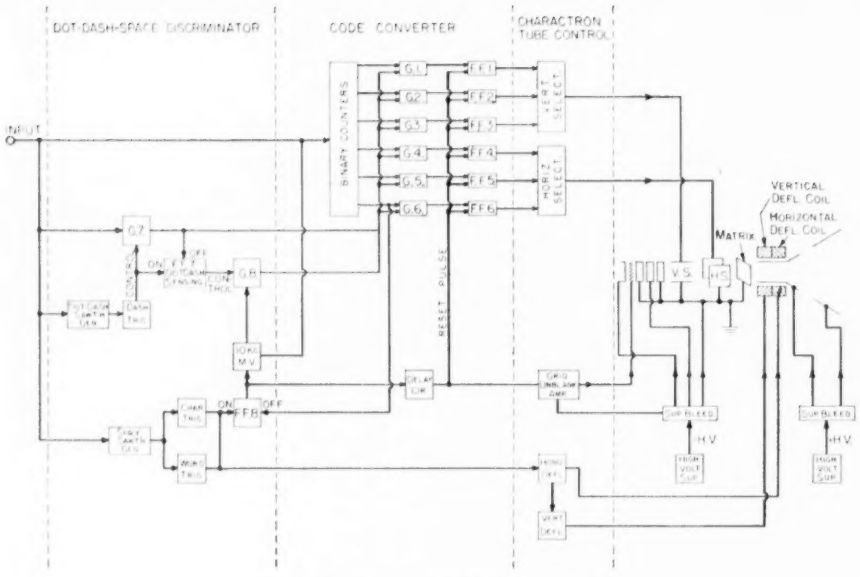


Fig. 3 — **Block diagram of the code converter.**

these pulses are passed or not passed by *G-7* depends upon the information produced by the third main channel of the dot-dash space discriminator. This channel contains a dot-dash sawtooth generator that produces a sawtooth for each dot and dash seen at its input. The amplitude of the sawtooth function is directly proportional to the length of the input function. For example, if a dash is three times the length of a dot, the sawtooth amplitude for a dash will be three times that for a dot. The sawtooth generator is followed by an amplitude-sensing trigger circuit labeled "Dash Trigger," which will trigger only when dash information is received. The output of this dash trigger circuit will close *G-7* when a dash has been received, but will allow *G-7* to remain open when a dot has been received.

Suppose now that the code for "N" (dash-dot) is received. The leading edge of the dash will advance the binary counter chain and open *G-1;* the dot-dash sawtooth generator will produce a sawtooth that will trigger the dash trigger which in turn closes *G-7*. The pulse produced by the trailing edge of the dash will not pass through *G-7*, since it is closed, and as a result no information reaches *G-1*. Therefore, *F.F.-1* remains in a "no" position.

The leading edge of the dot will advance the binary counter chain and open *G-2*. The Dash Trigger will not trigger, and *G-7* will remain open. A pulse produced by the trailing edge of the dot will pass through *G-7*, and through *G-2*, and then change *F.F.-2* to the "yes" position.

The fourth channel contains a "Space Sawtooth Generator" followed by two trigger circuits connected in parallel, a "character" trigger and a "word" trigger. This channel discriminates between an element space, a character space, and a word space. The sawtooth amplitude derived from the Space Sawtooth Generator is directly proportional to the length of the input signal space. An element space causes no action in this channel. A character space will cause the Character Trigger circuit to function, and a word space will cause both the Character Trigger circuit and the Word Trigger circuit to function. The latter action occurs by setting the Word Trigger circuit at a higher triggering level than the Character Trigger circuit.

When a character space is received, the Character Trigger circuit is energized, and *F.F.-8* assumes an "on" condition that turns on the 10-kc. multivibrator. The function of this multivibrator is to complete the binary count in the code converter and to set up either "yes" or "no" information in memory sections *F.F.-1* to *F.F.-6* that has not been set up by the input code.

If the last element preceding a character or word space is a dot, the remaining flip-flops (*F.F.-1* to *F.F.-6*) remain in the down or "no" condition, while if the last element preceding a character or word space is a dash, the remaining flip-flops assume the up or "yes" condition.

The above action occurs as follows: The Character Trigger is triggered, which flips *F.F.-8* to its "on" state, which turns on the 10-kc. multivibrator. If the last element of the code was a dash, the output of the Dash

Trigger flipped *F.F.-7* to the "on" condition, which opens *G-8* and allows pulses produced by the 10-kc. multivibrator to pass on to *G-1* through *G-6*.

At the same time, the 10-kilocycle multivibrator is advancing the binary counters and opening the remaining gates of *G-1* to *G-6*, allowing the pulses passing through *G-8* to pass through the above gates and change the remaining flip-flops (*F.F.-1* to *F.F.-6*) to the on or "yes" condition. If the last element of the code was a dot, the pulse out of *G-7* will flip *F.F.-7* to the "off" condition and close *G-8*. The output from the multivibrator will not pass through *G-8*, and the remaining flip-flops (*F.F.-1* to *F.F.-6*) will remain in the down or "no" condition. When the last count of the binary-counter has occurred, it will produce a pulse that flips *F.F.-8* to the "off" condition, which turns off the 10-kc. multivibrator.

The output of *F.F.-8* is fed also to a delay circuit that allows time to set up the binary memory circuit and then produces an unblanking pulse that is fed to the grid of the Charactron tube. The trailing edge of this unblanking pulse initiates a reset pulse that is fed to the memory circuit (*F.F.-1* to *F.F.-6*) and resets these flip-flops to the normal "no" condition in readiness for the next input code.

The outputs of the Character Trigger circuit and the Word Trigger circuit are fed to the deflection circuits that cause screen position advance. If a character space is received, only the Character Trigger circuit is energized, and one pulse is fed to the deflection circuits. If a word space is received, the Character Trigger circuit is triggered, and then the Word (space) Trigger circuit is also made to function, allowing two pulses to be sequentially fed to the deflection circuitry causing a two-space advance.

Discrimination and tolerance figures of Morse codes are shown in Figs. 4 and 5. Areas of acceptance for dots and dashes are explained in Fig. 4, while in Fig. 5 an explanation of the areas of acceptance will be found for word spaces, character spaces, and element spaces. The discriminating ability of the equipment regarding the length of dots, dashes and spaces will be found to be more than adequate over the range shown from 10 to 80 w.p.m. For example, at 60 w.p.m. the time of a dot may vary between 3 and 23 milliseconds; a dash, between 24 milliseconds and infinity; an element space, between 2 and 23 milliseconds; a character space, between 24 and 73 milliseconds; and a word space between 74 and infinity.

It should be kept in mind that the indicated speeds are based on normal time lengths of elements and spaces. For instance, if at a 60-w.p.m. rate the time of a dash is increased from 47 to 57 milliseconds, the average rate would, therefore, be less than 60 w.p.m. While the equipment is in the process of adjusting itself to instantaneous changes in speed, it is at the same time discriminating between the different length code elements and different length spaces of message codes. This automatic compensating action of the Charactron C.W. Receiver thereby permits the reception of individual codes without interruption, provided the tolerances set forth in Figs. 4 and 5 are not exceeded.

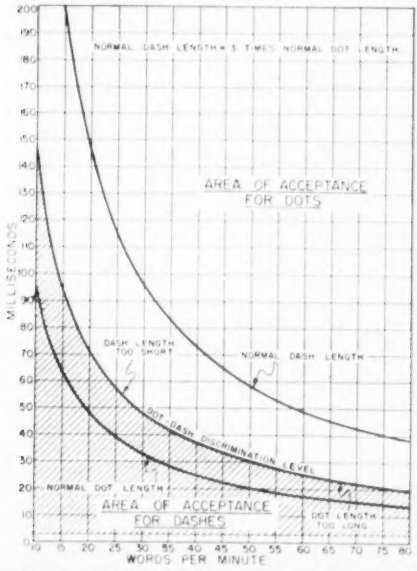

NORMAL DASH LENGTH = 3 TIMES NORMAL DOT LENGTH
AREA OF ACCEPTANCE FOR DOTS
DASH LENGTH TOO SHORT
NORMAL DASH LENGTH
DOT-DASH DISCRIMINATION LEVEL
NORMAL DOT LENGTH
AREA OF ACCEPTANCE FOR DASHES
DOT LENGTH TOO LONG
MILLISECONDS
WORDS PER MINUTE

Fig. 4 — Dot-dash discrimination and tolerance of the Morse code converter.

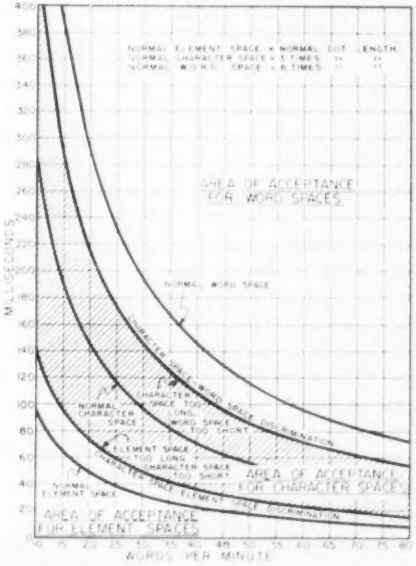

NORMAL ELEMENT SPACE = NORMAL DOT LENGTH
NORMAL CHARACTER SPACE = 3 TIMES " "
NORMAL WORD SPACE = 6 TIMES " "
AREA OF ACCEPTANCE FOR WORD SPACES
NORMAL WORD SPACE
CHARACTER SPACE - WORD SPACE DISCRIMINATION
NORMAL CHARACTER SPACE
CHARACTER SPACE TOO LONG
WORD SPACE TOO SHORT
ELEMENT SPACE TOO LONG
CHARACTER SPACE TOO SHORT
AREA OF ACCEPTANCE FOR CHARACTER SPACES
NORMAL ELEMENT SPACE
CHARACTER SPACE - ELEMENT SPACE DISCRIMINATION
AREA OF ACCEPTANCE FOR ELEMENT SPACES
MILLISECONDS
WORDS PER MINUTE

Fig. 5 — Character and word space discrimination and tolerance.

Selectivity and 'Phone Reception

Tricks with Your Present Receiver

BY BYRON GOODMAN,* W1DX

It doesn't take long for any ham, new or old, to realize that some receivers can separate signals better than others and that this characteristic is called "selectivity." Different makes and models of receivers vary in their selectivity, of course, but it is questionable if every operator utilizes the selectivity of his particular receiver to the fullest extent, and the purpose of this article is to describe how the selectivity can best be used.

However, before getting into these details, let's review the situation and see why we need selectivity and how it is used to separate signals. The selectivity we're talking about is usually obtained in the i.f. amplifier of the receiver — the receiver also has "front-end selectivity" that keeps out "images," but the real hard-working selectivity is in the i.f. amplifier.

A curve of the attenuation-*vs.*-frequency of an i.f. amplifier is called the "selectivity" or "response" curve of the i.f. amplifier — the circuits in the i.f. amplifier are the most selective in the receiver and so they determine the over-all selectivity of the receiver. The selectivity of a fair communications receiver (without crystal filter) might look as in Fig. 1. The nominal "intermediate frequency" is 455 kc. (frequency of minimum attenuation). The "bandwidth" at "6 db. down" (6-db. attenuation) is 5.5 kc., and the bandwidth at 60 db. down is 18 kc. The bandwidth at any other attenuation up to 70 db. (the apparent limit of measurement in this case) can be read from the curve.

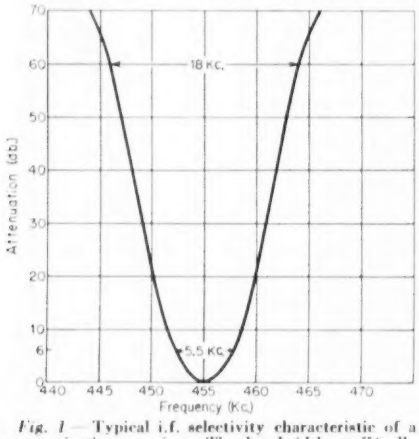


Fig. 1 **— Typical i.f. selectivity characteristic of a communications receiver. The bandwidth at "6 db. down" is 5.5 kc.; the bandwidth at 60 db. down is 18 kc.**

A curve like this means that a signal at 464 or 446 kc. will have to be 60 db. greater than one at 455 kc. to give the same output. If it were only 40-db. stronger it would end up in the output 20 db. weaker than the desired signal.

It's to our advantage, therefore, to have an i.f. amplifier in which the attenuation increases rapidly with frequency beyond the 10- or 15-db. point. Amplifiers with this characteristic are said to have good "skirt selectivity," and the ultimate (but unobtainable) curve would be a rectangle. Since "good skirt selectivity" is hardly a quantitative term, some engineers now use the expression "shape factor" to describe the skirt selectivity. The shape factor is the ratio of the bandwidth at some low attenuation (usually 6 db.) to the bandwidth at high attenuation (usually 60 db.). Hence the shape factor in Fig. 1 for the 6- and 60-db. points is $5.5 \div 18 = 0.305$. The selectivity characteristic of an amplifier is defined if the bandwidth at 6 db. down and the shape factor are known. "Bandwidth" by itself isn't of too much use to the amateur, because two amplifiers could have the same bandwidth (at 6 db. down) and have widely different shape factors. The bandwidth at 6 db. down is primarily of importance in determining the *fidelity* of response to a 'phone signal, as we will see later.

It's a simple matter to find out what kind of selectivity curve your receiver has, assuming that the S-meter reads in decibels to a fair degree of accuracy. (Some of the current receivers are pretty good in this respect.) All you have to do is tune through a stable carrier that doesn't quite pin the S-meter, with no other signals present. This signal can be a frequency standard, a VFO harmonic or any other unmodulated signal. By plotting the dial frequency against the S-meter readings, you will have a selectivity curve of your receiver, accurate within the limits of accuracy of the S-meter calibration and the frequency intervals on the tuning dial. You can tune the receiver with the signal source fixed, or you can tune the signal source with the receiver fixed, depending on whether the receiver or the signal source has the better calibration and more favorable tuning rate. If you have a crystal filter you can then cut it in and make a similar run, to obtain the crystal-filter selectivity characteristic.

Receiving an A.M. Signal

It's fairly easy to decide the maximum selectivity (minimum bandwidth) you can use in receiving a c.w. signal. Since practically all of the energy of a c.w. signal exists at a single frequency, you might expect that c.w. signals could be received on an i.f. amplifier with a 6-db. band-

* Assistant Technical Editor, *QST*.

width of only a few cycles. However, this is not the case, since an amplifier *that* sharp would "ring" unmercifully, and also tuning in a signal with such a sharp receiver would be well-nigh impossible. From a practical standpoint, the minimum possible bandwidth for c.w. work seems to be in the region of 120 to 150 cycles.[1]

Deciding upon the maximum useful selectivity for 'phone reception is not quite as simple. In the first place, an a.m. signal is a complex thing that can have energy existing over 6 to 16 kc. (Male speech is often given as ranging from 100 to 8000 cycles, but good communication requires an upper limit of only 3000 cycles or less. An upper limit of 3000 cycles requires an a.m. bandwidth of twice this, or 6 kc.) For purposes of discussion, let's assume a *perfect* male-voice a.m. transmitter, with no distortion and the ability to modulate without attenuation at any audio frequency up to 8000 cycles. Then the *possible* spectrum that the signal could occupy would look like Fig. 2, where it is drawn for a carrier frequency of 3900 kc. How much of this possible spectrum the signal occupies at any instant depends, of course, on the operator's voice (high- or low-pitched) and the syllables being spoken.

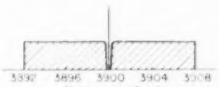


Fig. 2 — **The possible spectrum of a "perfect" a.m. transmitter used to transmit a male voice. The actual frequency distribution will vary from instant to instant, depending upon the speech.**

Fidelity

If the receiver is to reproduce the transmitted signal exactly, it must pass the carrier and both sidebands without attenuation. Suppose, for example, that our receiver i.f. has the selectivity characteristic of Fig. 1, and that we tune our receiver to set the signal of Fig. 2 squarely in this i.f. (the S-meter will read maximum at this point). Since our i.f. is down 6 db. at 2750 cycles off the midfrequency, a 2750-cycle component of speech will be attenuated by this amount. A 5000-cycle component of speech will be attenuated 22 db.! In other words, the high audio frequencies of the incoming voice will be attenuated, and the voice might sound slightly "bassy" or lower-pitched to a keen ear familiar with the actual voice. (An unthinking receiving operator might say that "the transmitter has no highs" or that "the audio of the receiver has no highs," when such is not the case — the transmitter is perfect, and the receiver audio system could also be perfect and the effect would still be there.) So it would appear that, for 'phone reception, we can't even use as much selectivity as shown in the curve of Fig. 1.

Fortunately, such is not the case. In the first place, no sensible amateur tries to build a "high-fidelity" transmitter (except to prove he can do it), and he usually has a high-audio-frequency response in the rig that drops off rapidly above 3 kc. If he is smart, he will decrease the low-frequency response in the transmitter, so that "highs" are transmitted at greater strength than the "lows," by comparison with his normal speech. Then at the receiving end the "sideband cutting" described in the previous paragraph will be somewhat compensated for and his voice will come out with more nearly its normal balance (varying with different receivers, however). (Another reason for cutting down the low-frequency response is that it makes the modulator's job easier and is more economical of a.f. power.)

How Much Selectivity?

Now that we have boiled down our "perfect" transmitter to a "practical" one that passes, say, only up to 3000 cycles, the possible spectrum will look like Fig. 3. Centered in our i.f. amplifier of

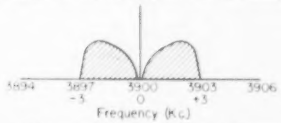


Fig. 3 — **The possible spectrum of a "practical" a.m. transmitter. The components beyond 3000 cycles are deliberately eliminated, and the lower voice frequencies are attenuated.**

Fig. 1, it will suffer only slight attenuation of its high audio frequencies. If we detune it slightly to one side or the other, we can include some more of one sideband and thus improve the "highs." This is an effect you have all noticed when tuning with a fairly sharp receiver. It now becomes apparent that the ultimate to which this process can be carried is with an i.f. bandwidth of just under 3000 cycles, when the receiver could be tuned so that the i.f. was accepting just one sideband. If we don't mind losing some of the "highs" in the original signal, we can use a bandwidth down to around 2000 cycles (there is no general agreement on the figure — some will set it lower and some higher) and still get intelligible speech through. It won't be a faithful reproduction of the original, but it will have a high communications value.

But now we run into a problem. Let's say that we have a sharp i.f. of 2000 cycles bandwidth at 6 db. down and 6500 cycles at 60 db. down. Its curve would look like Fig. 4. (This is the selectivity characteristic of a BC-453 "Q5-er.") If we superimpose it on one sideband of the signal in Fig. 3 (as we do in effect when we tune the receiver), we can plot the resultant signal that appears at the detector. This is shown in Fig. 5 for two different tuning conditions. The tuning condition at A passes one sideband without much alteration of its relative amplitudes — the tuning condition at B has cut the "highs" and accentuated the "lows." But look at the poor carrier! In A it has been knocked down better than 20 db., and 10 db. in B. Now the signal appearing at the detector has insufficient carrier, and the net effect is as though we were receiving a badly-

[1] Kaye and Kaye, "One Db. per Cycle!", *QST*, Nov., 1951.

overmodulated signal.[2] There will be considerable distortion in the detection process, although the signal can usually be copied.

Here, then, is another limitation to how much selectivity we can use — we can't use it to the point where it takes a good signal and makes it appear at our receiver's detector and audio system as an overmodulated signal. What's the solution? There are several, and they make up the meat of this article.

Improved Shape Factor

Suppose that instead of the selectivity curve of Fig. 4 we could build an i.f. amplifier with a selectivity curve that looked like a rectangle, as in Fig. 6. Then as long as the carrier fell within the passband it would be unattenuated, and we wouldn't have to worry about the overmodulation effects mentioned above. We could utilize up to 3000 cycles of a single sideband (carrier at edge of passband), or 1500 cycles of double sidebands (carrier centered in passband). Furthermore, it wouldn't be too hard to tune, since once the carrier was within the passband, tuning through would only change the relative "highs" in the audio output. In other words, there is a 3-kc. space on the dial where the carrier can be set and the voice can be heard (although varying in the amount of "highs"), and hence the tuning is not too critical.

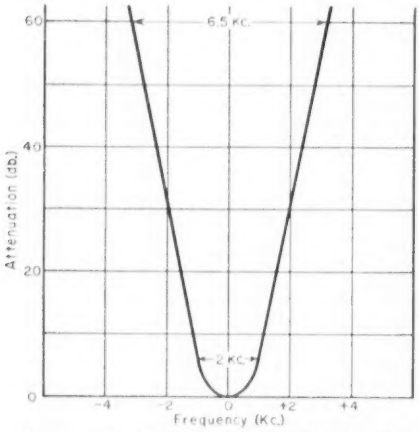


Fig. 4 — **The i.f. selectivity characteristic of a typical "sharp" receiver (the BC-453 "Q5-er"). Notice that at 60 db. down it has about a third of the bandwidth of the i.f. of Fig. 1.**

But you don't just go down to the corner store and order an i.f. amplifier like that. You wait around wishing for one, and finally someone describes something that *approaches* it, like the crystal-lattice filter[3] or the Collins mechanical filter.[4] These filters have a big advantage over the characteristic of Fig. 4 in that they have a relatively "flat" bottom and almost vertical sides so they approach the "ultimate" of Fig. 6. To the extent that their characteristics approach Fig. 6, their performances approach that described in the preceding paragraph. They are certainly superior to an i.f. with the characteristic of Fig. 4.

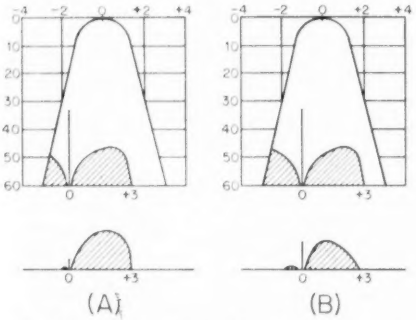


Fig. 5 — **The upper sketches show the i.f. characteristic of Fig. 4 (with the vertical scale reduced for convenience) superimposed on the 'phone signal of Fig. 3. The resultant signals that appear at the detector are shown in the bottom sketches. Notice how the slight difference in tuning has modified the carrier amplitude and the relative amplitudes of "highs" and "lows" in the sideband.**

To reject an interfering signal, you tune the desired signal a little to one side or the other, until the undesired signal drops out of the passband. The carrier of the undesired signal will drop out while one sideband (or a portion of it) remains, but the QRM is not as damaging as when the undesired carrier (and hence a heterodyne with the desired carrier) is present.

Exalted-Carrier Reception

But everyone doesn't have a crystal-lattice or a mechanical filter, and the selectivity found in most ham shacks is perhaps the receiver's crystal filter or some auxiliary selectivity like that shown in Fig. 4. How can you use it to best advantage without attenuating the carrier? One thing you can do is to take a page from the book of the s.s.b. gang, and make up for the lack of carrier at the detector by substituting a locally-generated one. All this high-falutin' language means is that you turn on the receiver's b.f.o. and zero it to the (weak) incoming carrier. (For example, in the detector signal shown at the bottom of Fig. 5A, the b.f.o. would be set to coincide with the carrier signal) about — 1.6 kc. off the i.f. center frequency.) The b.f.o. takes the place of the attenuated carrier. If the b.f.o. isn't exactly zero beat (a much more likely condition!) there will be some distortion, something like what is heard whan an s.s.b. signal is not properly tuned. (You will get a steady audible beat if you're too far off.) But, as in the reception of an s.s.b. signal, the voice can be understood even though it is not perfectly natural. The extent to which this can be tolerated depends primarily on how anxious

[2] Technical Topic, "How To Visualize a 'Phone Signal," *QST*, July, 1950.

[3] Weaver and Brown, "Crystal Lattice Filters for Transmitting and Receiving," *QST*, June and August, 1951.

[4] Roberts, "Mechanical Bandpass Filters for I. F. Ranges, *QST*, Feb., 1953.

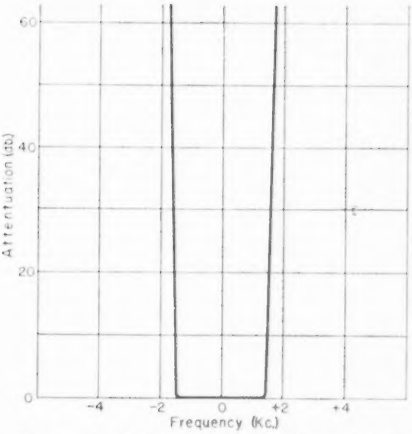


Fig. 6 — **An "ultimate" bandpass characteristic for an i.f. amplifier for 'phone reception. It can be approached with some of the current techniques.**

you are to hear what the other fellow is saying. But this is a good stunt to have in your bag of tricks — you simply start to make a single-sideband signal out of the incoming a.m. signal by partially lopping off the carrier and one sideband, and then you receive it as you would any other s.s.b. signal. You have to watch the same things: r.f. gain well below the overload point, plenty of audio volume, and b.f.o. set properly in relation to the i.f. passband. Practice it a few times on signals that are "in the clear" — it may take a little while to get the feel of slow tuning and to find the proper setting of the b.f.o. for best audio balance.

One important advantage of this (and any other) exalted-carrier reception hasn't been mentioned yet. At the detector, the audio you hear is the beat between the highest-amplitude signal (normally the carrier) and the side frequencies that make up the sideband. If the carrier amplitude drops down (through selectivity or fading), the audio you hear is a result of the beats between the side frequencies and whatever component has the greatest amplitude. If the drop in carrier amplitude isn't too great, the only obvious effect is a little distortion, but with significant carrier attenuation the distortion can become quite marked and even downright obnoxious. It is to your advantage, therefore, to maintain the carrier at considerable amplitude above the side frequencies at all times. Interfering signals of greater amplitude can also "take over" to cause distortion, unless their frequencies coincide with the carrier frequency (when the resultant beats would be the same, frequencywise). Hence, using the local oscillator to furnish a local carrier, as described previously, give us protection against the distortion obtained when the carrier fades or another carrier attempts to "take over."

Another way that we can obtain the same result, but without using the b.f.o., is to amplify the carrier frequency more than any other. To do this requires a receiver with, in the ideal case, an i.f. characteristic like that shown in Fig. 7A. With this we could set the carrier at 455 kc. (by proper tuning of the "front end") and the carrier would fall in the "slot" and one sideband would be passed by the shoulder. This is an unrealizable characteristic, however, and we have to settle for a compromise. A crystal-filter characteristic can look like Fig. 7B at some setting of the phasing and selectivity controls, and it can be used for exalted-carrier reception of an a.m. signal by careful front-end tuning. It is obtained in the *sharpest* position of the selectivity control (contrary to usual crystal-filter practice for 'phone reception, where the filter is set in the broadest "in" position). The tuning will be critical, since the spike of the crystal is quite sharp, but the a.v.c. and S-meter can be used for tuning if the receiver is stable. The audio output will be attenuated considerably, and some receivers may not have enough audio gain for best results, but along with the reduction in audio gain will go a great attenuation of QRM. The receiver is tuned for maximum S-meter reading, but it will be much sharper than anything you ever tuned before. Don't wait until you get into a tough spot to learn the technique — try it out on a few "in-the-clear" signals some time until you get the hang of it. It is a good trick to have in your bag. The audio will not be as boomy as it usually is with the crystal filter in the "broad" position.

In passing, it might be mentioned that there are available "selectable sideband adapters" that add to the effective selectivity of a receiver. The Central Electronics "Sideband Slicer" and the General Electric YRS-1 use a phasing principle[5] similar to that used in one type of s.s.b. generator, and they both offer exalted-carrier reception of incoming signals along with the selectivity feature.

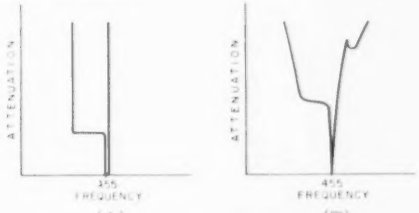


Fig. 7 — **An "ultimate" exalted-carrier selectable-sideband characteristic, A, can be approached by a setting of the crystal filter that gives the characteristic of B.**

And there you have a brief outline of the problems involved in receiving 'phone signals in crowded bands, and two simple tricks you can do with your present communications receiver to help solve these problems. Maybe your receiver isn't the best in the world (whose is?), but it's almost dollars to doughnuts that you aren't using it to full advantage. But you can, with just a little practice.

[5] GE *Ham News*, Vol. 6, No. 4, July, 1951.

A Simple 2-Element Beam for 20

Suggestions for a Low-Cost Installation

BY ORVILLE F. BAUER,* W2TEX

• Not all of us have the space or means to build a high tower and a three- or four-element rotating beam antenna. While the two-element job described here by W2TEX won't match the performance of a more elaborate installation, it does give a worth-while gain over the average 20-meter dipole. Those who are looking for something inexpensive, yet effective, will find plenty of suggestions in this article.

MANY amateurs working DX on 20 meters hesitate to put up a beam antenna, because they visualize a high tower and complicated mechanical construction. It is true, of course, that a 4-element job on a 100-ft. tower will outperform a less-pretentious antenna that just clears the roof. However, it is equally true that a simple two-element beam, requiring only light construction and a short pipe mast, will outperform most dipoles, folded or otherwise. Using 200 watts input on 'phone with such a beam antenna, the first six CQs were answered by five DLs and one I. Solid contact with Europeans has been maintained for as long as three hours.

In addition to the fact that a two-element beam can be supported on a light structure, it has the advantage that it has a relatively broad frequency response, and I have no trouble in operating it from one end of the band to the other. Furthermore, if a folded element is used for the radiator, with 0.13 wavelength spacing between the driven element and the director, the feed-point impedance should be a pretty close match for a 72-ohm line.

*22 Ross St., Rochester 15, N. Y.

Antenna Construction

The accompanying sketches suggest several constructional details. The boom (see Fig. 1) is made of two pairs of 2 × 2s 8 ft. 7 inches long, bolted together and spaced at the center by a double thickness of 12-inch-square pieces of 2-inch plank. The wood is faced, top and bottom, with a sheet of ¼-inch aluminum extending 2 inches on two opposite sides to provide a support for the boom members.

Pipe flanges are used to attach the boom to a pipe mast, and to mount a short pipe support above for guy wires running to the ends of the boom.

The elements are made of 1-inch aluminum tubing with a $\frac{1}{16}$-inch wall, and $\frac{7}{8}$-inch tubing with $\frac{1}{32}$-inch walls. The smaller tubing slides into the larger so that the over-all length can be adjusted. The ends of the two sections forming the folded dipole are plugged with aluminum rod, drilled and tapped for screws that can be used to fasten aluminum straps joining the ends. The spacing between the two sections is 5 inches, although this is not critical.

For a center frequency of 14.25 Mc., I made the dipole 33 ft. 4 inches long, and the director 32 ft. 1 inch long.

Since the elements are supported at low-voltage points, wood boiled in paraffin makes a sufficiently good insulator. Fig. 1 shows how the wood mountings are made and fastened to the ends of the boom. Only one hole is required for the director, of course. Similar, but smaller, blocks are used to keep the two sections of the dipole

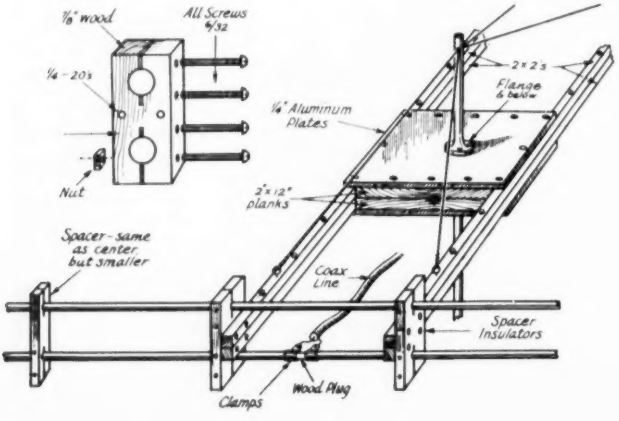


Fig. 1 — Details of the boom and element supports for the low-cost 2-element 20-meter beam.

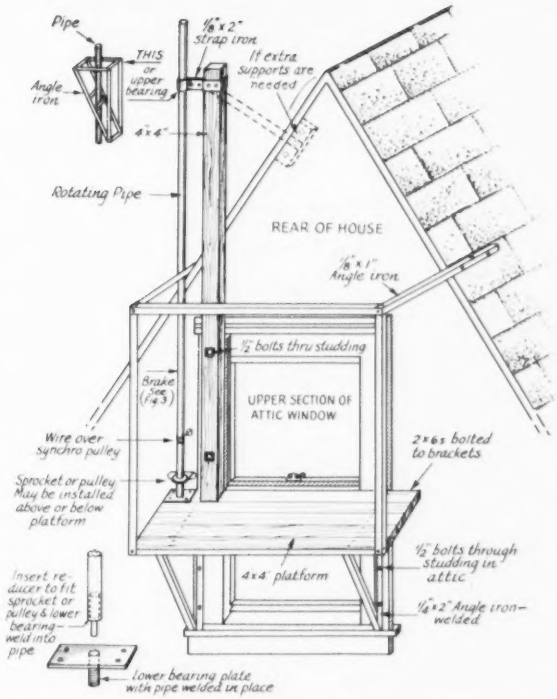

Pipe
1/8" x 2" strap iron
THIS or upper bearing
If extra supports are needed
Angle iron
4"x4"
Rotating Pipe
REAR OF HOUSE
1/8" x 1" Angle iron
1/2" bolts thru studding
Brake (See Fig 3)
UPPER SECTION OF ATTIC WINDOW
Wire over synchro pulley
2"x6"s bolted to brackets
Sprocket or pulley May be installed above or below platform
1/2" bolts through studding in attic
4'x4' platform
Insert reducer to fit sprocket or pulley & lower bearing— weld into pipe
1/4"x2" Angle iron— welded
Lower bearing plate with pipe welded in place

Fig. 2 — The beam can be supported by a 4 × 4 bolted against the rear of the house. If an attic window is available, a platform will provide a convenient means of installing and working on the beam.

evenly spaced throughout their lengths. The wood should be cut to size, and the holes bored to give a snug fit before the pieces are paraffined. A wood plug, boiled in paraffin, is used to separate the ends of the tubing at the feed point.

The Support

Fig. 2 shows a method of mounting the beam that can be quite easily applied in many cases. A 4 × 4 is bolted to the attic window frame and the studding behind it. This provides support for an upper bearing for the rotating pipe mast. The lower bearing (shown in a detail sketch) may be supported by a block fastened to the side of the house, or by a platform, such as that shown in the sketch. I have found the platform very convenient, as well as safe, in working on the beam. In my case, the 4 × 4 is 15 ft. long and the rotating pipe 20 ft. long and 1¼ inches in diameter.

Fig. 3 is the sketch of a simple friction brake. It should be adjusted so that the beam will hold its position in whatever wind is to be expected. The adjusting bolt goes through both the 4 × 4 support and the stud, so that it may be adjusted from the inside. The brake consists of a 6-inch length of pipe split lengthwise. The inside diameter of the section of pipe should be the same as the outside diameter of the rotating pipe. The inner piece is fastened to a block to fit between the outside wall of the house and the rotating pipe. The outer piece is fastened to a 2-inch-wide strip of iron, ¼ inch thick. The bolt at the left-hand end is taken up until the right-hand end of the metal strip is about an inch away from the 4 × 4. Then, taking up on the bolt at the right-hand end will exert a leverage on the brake.

(Continued on page 104)

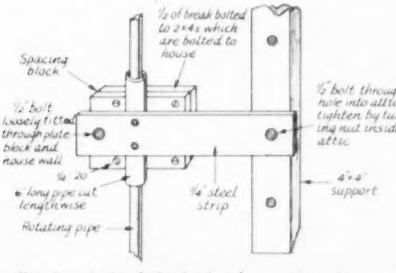

½ of break bolted to 2"x4"s which are bolted to house
Spacing block
½" bolt loosely fitted through plate block and house wall
⅜-20 6" long pipe cut lengthwise
Rotating pipe
¼" steel strip
½" bolt through hole into attic— tighten by turning nut inside attic
4"x4" support

Fig. 3 — A simple brake for the rotating pipe mast.

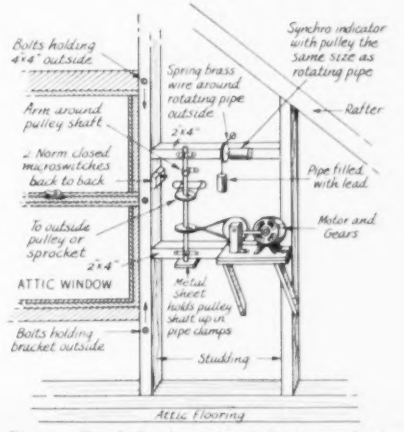

Bolts holding 4"x4" outside
Synchro indicator with pulley the same size as rotating pipe
Spring brass wire around rotating pipe outside
Rafter
Arm around pulley shaft
2"x4"
2 Norm closed microswitches back to back
Pipe filled with lead
To outside pulley or sprocket
Motor and Gears
2"x4"
ATTIC WINDOW
Metal Sheet holds pulley shaft up in pipe clamps
Bolts holding bracket outside
Studding
Attic Flooring

Fig. 4 — Sketch showing a simple driving mechanism and direction indicator for the beam.

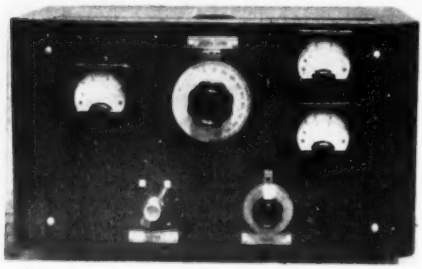
Dressing Up the Antenna Coupler

A Versatile Unit for Balanced and Unbalanced Lines

BY J. P. NEIL,* VE3PN/W6

LIKE many other hams, the writer has had need for an all-purpose antenna-matching unit embracing useful features normally not self-contained. This piece of equipment incorporates the following: low-pass filter, switching to a coax-coupled antenna tuner for a balanced transmission line, send-receive relay, and r.f. ammeters for both balanced and unbalanced transmission lines.

The photographs show the front, rear and bottom views of such a unit. This system was designed for powers of under 175 watts or, to be more specific, for feeding a Viking II either directly to a 75-ohm unbalanced (coax) line or, through an antenna tuner, to a 300-ohm or other balanced line. However, with modifications as to ratings of components as necessary, the unit can be altered to take care of higher power and/or additional coax feed lines.



A compact transmitter tuning and switching unit with neat appearance.

* 1567 College Ave., Palo Alto, Calif.

• In this article, VE3PN describes a matching unit very convenient for handling a variety of antennas. Although it is within small dimensions, it includes a low-pass filter and means of switching between balanced and unbalanced transmission lines.

Circuit

Fig. 1 shows the wiring of the unit. A ceramic rotary switch, S_1, selects either of two 75-ohm coaxial cables. One of these feeds a half-wave 10-meter dipole directly, while the other is coupled to a conventional antenna tuner (C_6L_6). The antenna tuner is used to provide balanced output. In this instance, the tank circuit values are such that both 20 and 40 are covered with the same coil. With suitable capacitor values and plug-in coils, other bands may be covered, of course. It may be noticed in the rear-view photograph that a second tuning condenser is ganged to the first. This was provided in anticipation of possible operation on 80 meters, when the two condensers would be connected in parallel. To economize both in space and cost, a single-section tuning condenser is used. Provided it is spaced an inch or so away from the surrounding metal, experience has shown that no unbalance of consequence results.

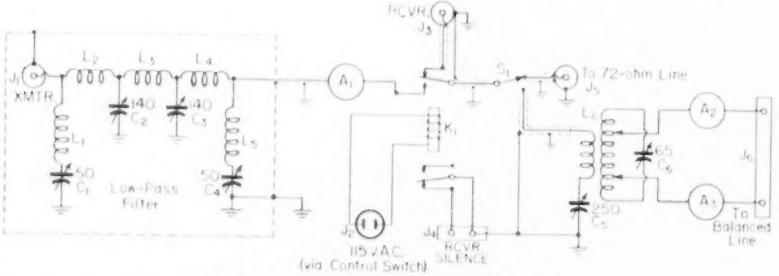


Fig. 1 — Circuit of the antenna-matching unit.

C_1, C_4 — Midget variable (set at approx. 32 $\mu\mu$f.).
C_2, C_3 — Midget variable (set at approx. 106 $\mu\mu$f.).
C_5 — Bud CE-2007 (0.03-inch spacing).
C_6 — Johnson 70F30 (0.075-inch plate spacing) (see text).
L_1, L_2, L_3, L_4, L_5 — All wound with No. 14 enameled wire, $\frac{1}{2}$-inch i.d., 8 turns per inch. B & W 3002 Miniductor may also be used. L_1 and L_5 have $6\frac{1}{2}$ turns; L_2 and L_4 have $9\frac{1}{2}$ turns; L_3 has $11\frac{1}{2}$ turns.
L_6 — Approx. 15 μh. for 7 & 14 Mc. (see text) (B & W 40-TA with 1 turn removed from each end) (19 turns No. 12, $2\frac{1}{2}$-in. i.d., $3\frac{3}{4}$ in. long).
A_1 — R.f. ammeter — 2-amp. scale for 75-ohm line and under 200 watts output.
A_2, A_3 — R.f. ammeter — scale dependent on line characteristics.
K_1 — Dow coaxial relay with auxiliary contacts.
S_1 — Two-wafer ceramic rotary switch, terminals connected in parallel (see text).

The coax line to the coupler is tuned by C_5, and r.f. ammeters (A_2 and A_3) are provided in both sides of the balanced line.

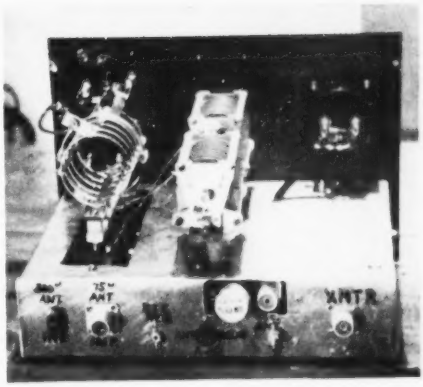
The selector switch (S_1) is connected to a Dow coaxial change-over relay (K_1) that connects the line selected by the switch to either transmitter or receiver. The relay line to the transmitter goes through an r.f. ammeter (A_1) and a low-pass filter before connecting to the transmitter output. The Dow relay has a set of auxiliary contacts, and these are used to silence the receiver during transmissions.

Construction

A commercially-available cabinet with an 8 × 12-inch panel and an over-all width of 14½ inches was used as the enclosure for the unit. A chassis of 20-gauge aluminum was tailor-made to fit the cabinet. Its size is 8 by 11 by 2½ inches. Panel components were arranged to present a neat symmetrical appearance consistent with proper placement of the tuning condensers and tank coil above the chassis, and of the selector switch and link tuning condenser below. On the panel, left to right, along the top are the link r.f. ammeter (A_1), the dial for the antenna-tuner condenser (C_6), and the two r.f. ammeters (A_2 and A_3) in the balanced line. Below are the selector switch (S_1), and the link tuning dial for C_5.

In the rear view may be seen the antenna-tuner tank coil and condenser. Left to right, along the rear edge of the chassis, are connectors for 300-ohm Twin-lead (or tuned line) (J_6), and coax cable from the doublet (J_5), a 'phono jack (RCA) (J_3) for the receiver, terminals for receiver silencing (J_4), a.c. power connector (J_2), a ground terminal, and another coax connector (J_1) for the transmitter output.

In the bottom view are shown the low-pass filter with cover removed, selector switch (S_1), link tuning condenser (C_5), the antenna-tuner-coil jack bar (for L_6), and the Dow coaxial relay (K_1). Although a B & W coil was used for the antenna tuner, a homemade jack bar of high-grade bakelite was used, and mounted under a slot cut out of the chassis. Otherwise, the mounted coil would have come too close to the top of the cabinet, leaving no room for inductor clips. It is spaced below the chassis top sufficiently to allow the top of the coil to clear the



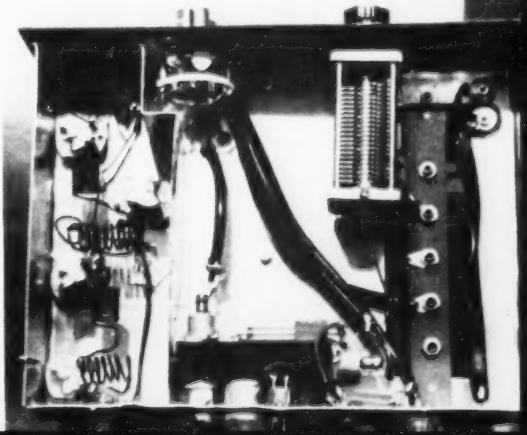
Rear view of the antenna-coupler unit.

cabinet cover. The antenna-tuner condenser (or condensers) is mounted on 1-inch stand-off insulators and placed at the center of the chassis. An insulating coupling is used in the shaft.

The low-pass filter is constructed and adjusted following the data given in the filter table in the TVI chapter of the ARRL *Handbook*. Values in the column for 75 ohms and variable condensers were used. The unit is enclosed in a shield box that fits under the chassis, along the left-hand side in the bottom view. A bottom cover is used to enclose completely the filter, but is not shown in the photograph.

All leads to the filter box, coax-line ammeter, selector switch, link-coil jack, and coax output connector are made with RG-59/U cable. Although S_1 is shown in Fig. 1 as a single-gang switch, a double-wafer switch with corresponding terminals wired in parallel for greater current-carrying capacity is recommended. Connections in the filter and antenna tuner are made with No. 14 tinned wire. Twin-lead was used to connect the two r.f. meters in the antenna tuner to J_6. However, wider spacing and better insulation might be necessary if the tuner is to feed a line with an appreciable s.w.r.

I have found the unit most convenient, not only for working the above-mentioned antenna systems but also for feeding a folded dipole and some verticals.



Bottom view of the compact antenna unit, showing the low-pass filter, change-over relay and link tuning condenser.

• *On the* **TVI** *Front—*

LICKING U.H.F. STRIP TVI— A SUCCESS STORY

The problem of interference by 2-meter transmitters to TV sets using strips for u.h.f. conversion has been discussed previously in our pages.[1,2] In this department in December, 1953, *QST* (p. 62) a call was sounded for v.h.f. men to use "Dallas Plan"[3] tactics in combatting this new threat to 144-Mc. operation. The following letter from W9MUD shows that this plan of attack will work.

Decatur, Ill.

Technical Editor, *QST*:

Thank you very much for your letter and the enclosures. Fortunately, it has not been necessary for me to use the trap you described, so I cannot tell you how it works. In fact, the excellent cooperation of Harold Cowgill, general manager, and James Wulliman, chief engineer, of our local u.h.f. TV station, WTVP, Channel 17, has made it unnecessary for me to remedy a single case of TVI. When they received the first complaints they called me to get my side of the story. A brief description of the condition causing TVI on sets using u.h.f. strips was all that was necessary to convince them where the trouble was. They agreed that it was not my fault and they have since referred viewers having trouble back to the dealer. In a few special cases they referred the lookers-in to me for help and I was able to advise them to get all-channel converters. In all instances the change to a converter eliminated the trouble — there are six TV receivers located within 100 feet of my antenna, all using converters. Fortunately, I was also able to suggest to these neighbors what kind of set to buy. (In this area we are receiving Channels 15, 17, 19, 20 and 43.)

The 144-Mc. transmitter at this station is one of my own design and construction, using push-pull 6146s in the final and running 70 watts input. The tube line-up was planned to eliminate TVI and is as follows: 6C4 overtone oscillator on 24 Mc., 6AQ5 doubler to 48 Mc., and push-pull 5763 triplers to 144 Mc. driving the 6146s. You will note that no harmonics fall in any locally-used TV channel and that the 6146s have more than enough drive.

The rest of the station consists of a 16-element collinear beam 68 feet high and an HRO-7 receiver with a homebuilt crystal-controlled converter. The HRO-7 receiver caused more TVI locally than the transmitter. Radiation of the oscillator would take out Channel 5 when it was used with the converter. Substitution of shielded 300-ohm Twin-Lead for coax in the connection between the units eliminated this trouble.

With the above combination, I have been able to work 12 states in six call areas. I am on 144 Mc. an average of five nights a week, usually between 8 and 10 o'clock, and in the past month have not received a single complaint. As I am the only station on 144 Mc. in this city, the going was rough previously, but now that the local TV station, dealers and TV viewers are familiar with the strip problem and its remedy, viewers are enjoying their TV and I am having my fun on the air.

I hope this information will aid someone else who has the same problem. The use of the all-channel converter seems to be the best suggestion for licking TVI from a 144-Mc. rig during u.h.f. TV reception, although one of the local servicemen did have good results with Meissner type 15-7514 wavetraps.

— *Roy A. Cartier, W9MUD*

P.S.: I think one of the things which made the dealers take action to satisfy their customers is that I made it very clear that since my transmitter was "clean," I was going to continue operation until such time as FCC ordered me to shut down. I refused to go off the air for even one program. Admittedly I do have some fancy new names, but concentrated and firm effort has relieved the situation. — *R.A.C.*

[1] "It Seems to Us," November, 1953, *QST*, page 9.
[2] "Channel Strip TVI," November, 1953, *QST*, page 45.
[3] "The Dallas Plan for TVI," Skelton & Shook, June, 1951, *QST*, page 26.

REMINDER — TELEVISION SCRIPT ON TVI AVAILABLE

Affiliated clubs and TVI committees are reminded of the availability of ARRL's new television script on TVI, planned for presentation on stations in localities where low-band v.h.f. TV is in existence. The show, timed to 15 minutes' duration, is of the panel- or interview-type format, and comes complete with a set of effective slides.

To hold the attention of a typical TV station audience, the material has been prepared in layman's language, explaining the interference problem so it can be understood by viewers sitting in their own living rooms. Since amateur interference is but a small percentage of the over-all problem, the program also drives home the point that interference can be caused by f.m. receivers, TV receiver oscillators, diathermy, household appliances, etc. Much of the material has been based on the TVI demonstrations given around the country by ARRL's Philip Rand and Lewis G. McCoy.

Sound out the commercial manager of your local TV station on the possibility of using the program as a public service feature. Once you get tentative acceptance, give us the word and we'll put you on the schedule for loan of the "packaged" show.

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

A Crystal-Controlled Converter for 21 Mc.

Stability and Bandspread Coverage with Any Communications Receiver

BY EDWARD P. TILTON,* W1HDQ

• You're missing some fun if you haven't tried your hand at working DX on 21 Mc. If the receiver problem has been holding you back, here's the answer — a crystal-controlled converter that provides the same degree of bandspread and stability on 15 that your receiver offers on 80.

THE highest frequency that is open for long-distance communication is always an interesting band to work. The skip is capricious, and you can't count on solid contacts in every direction every day, but when the band is open anything can happen. At this point in the sunspot cycle, 21 Mc. is such a band. Signals may come bounding in from halfway around the world, and when conditions are right DX can be worked with moderate power and simple antenna equipment.

But first you have to be able to *hear* the DX. This may not be easy unless you have one of the newer receivers, and a fairly expensive one at that. Because the 21-Mc. band is a recent amateur acquisition, receivers more than a couple of years old have no provision for it. Most of them tune *through* it, but only by means of an infinitesimal movement of the general-coverage dial that makes accurate tuning almost impossible. Some war-surplus receivers, otherwise quite adequate, don't even go this high in frequency. And the lower-priced of our current crop of new models may be none too good in their 21-Mc. performance, even though they do have bandspread coverage. Single-conversion receivers with but one r.f. stage, for example, may suffer from inadequate image rejection, and the stability of the low-priced lines may leave quite a bit to be desired.

The obvious solution to the 21-Mc. receiver problem, then, is some form of converter, preferably crystal controlled. Fortunately, it need not be complex, costly or hard to build, as may be seen from the accompanying illustrations. Two tubes and easily-adjusted circuits take care of the job very nicely.

Circuit Features

Our converter is designed to be an inconspicuous accessory. It can be placed on top or in back of the regular station receiver, and may be plugged directly into the accessory socket of the receiver if it is convenient to do so. Where the receiver is not equipped with such a socket it is a simple matter to tie into the filament and B-plus circuits for the converter power. As the drain is low, almost any receiver will supply the necessary power without undue strain.

The oscillator, one half of a 12AT7, is crystal controlled, for maximum stability and pure d.c. notes in c.w. reception. The crystal is a standard 3500-kc. unit operated on its 5th overtone, 17,500 kc., using the so-called Robert Dollar circuit, credit for the origination of which should go to W6EFT. The other half of the 12AT7 is the mixer, the i.f. output being 3500 to 3950 kc. for covering 21,000 to 21,450 kc.

Any communications receiver worthy of the name will give a good account of itself at this frequency, but the over-all gain of the converter is sufficient for even the least sensitive. Results on 21 Mc. will be limited only by the stability, selectivity and dial characteristics of your receiver at 3500 kc.

Looking down at the 21-Mc. crystal-controlled converter, we see the r.f. stage at the right and the mixer-oscillator at the left. The crystal socket at the right is the antenna terminal. The power-fitting on the wall of the chassis may be plugged directly into a receiver accessory socket, where it is convenient to do so.

The r.f. amplifier may be any of the r.f. pentodes such as the 6AK5, 6CB6, 6BH6 and others, though a 6CB6 is shown. As has been pointed out many times, the ultimate in noise figure and gain is not required at this frequency. External noise picked up by the antenna is the limiting factor in weak-signal reception with any well-designed r.f. stage operating below about 30 Mc. or so. The noise figure of this amplifier is around 3 db., and it provides plenty of gain, but its most important function is the rejection of unwanted signals at the image and intermediate frequencies. The converter is one of several built in the process

* V.H.F. Editor, *QST*.

of obtaining satisfactory characteristics in the latter respects.

Somewhat simpler r.f. circuitry may be employed if one doesn't mind having signals from other frequencies in the tuning range. These can be mighty confusing at times, as the i.f. is the 80-meter band and the image frequency is the 20-meter band and some adjacent commercial territory. It can be seen that real front-end selectivity is required in a set-up like this if the operator is to avoid calling stations that are on some other band! Spurious responses in this converter are a minimum of 60 db. below 21-Mc. signals of the same strength, so spurious signals are produced only by stations in the next-block category. With a selective antenna system such as a well-matched parasitic array, spurious-signal rejection will be even better. The final model was checked on 20- and 80-meter antenna systems to make its task as difficult as possible.

Three tuned circuits at the signal frequency achieve the desired degree of selectivity, and they also make it possible to flatten the response across the entire 21-Mc. band. The input circuit is tuned on-the-nose at the middle of the band. The r.f. plate and mixer grid circuits can be stagger-tuned slightly if necessary, and the slug in the i.f. plate winding is a further aid in this respect.

Neutralization shown in the r.f. amplifier circuit may not be necessary when the converter is used with an antenna system that loads the r.f. stage down adequately. Random lengths of wire and center-fed systems using tuned feeders present wide values of input circuit loading, however, so the stage may oscillate unless it is neutralized. The neutralizing method is the capacity-bridge system often used with transmitting tetrodes.

Construction

The converter is built on a 4 × 6-inch piece of aluminum which mounts on a 2 × 4 × 6-inch aluminum chassis that provides shielding and mechanical support. Looking at the top view, the r.f. amplifier stage is at the right. The crystal socket at the right is the antenna connection. At the lower right the input tuning condenser, C_1, may be seen, and just to the lower left of the tube socket is a quarter-inch hole through which the neutralizing capacitor adjustment projects. The mixer-oscillator tube is at the left, with the crystal and the oscillator coil slug adjusting screw in the foreground. Across the back, from left to right, are the i.f. adjustment, the mixer grid trimmer, C_4, and the r.f. plate trimmer, C_3.

On the front wall of the chassis is the octal power connector, J_2, and the coaxial i.f. output fitting may be seen at the left end of the chassis. At the writer's station, the converter is plugged directly into the accessory socket of an HRO-7, and the same coaxial cable and plug that are used with several v.h.f. converters plugs into the 21-Mc. converter when it is to be used.

In the bottom view the r.f. input circuit shows at the right of a small copper shield that mounts across the 6CB6 socket. Across the bottom of the photograph are the r.f. plate and mixer tuned circuits and the i.f. plate coil. The oscillator components are at the upper left and the neutralizing capacitor is close to the r.f. shield.

The tube sockets are centered on the cover plate, 1¾ inches in from each end. Mounting

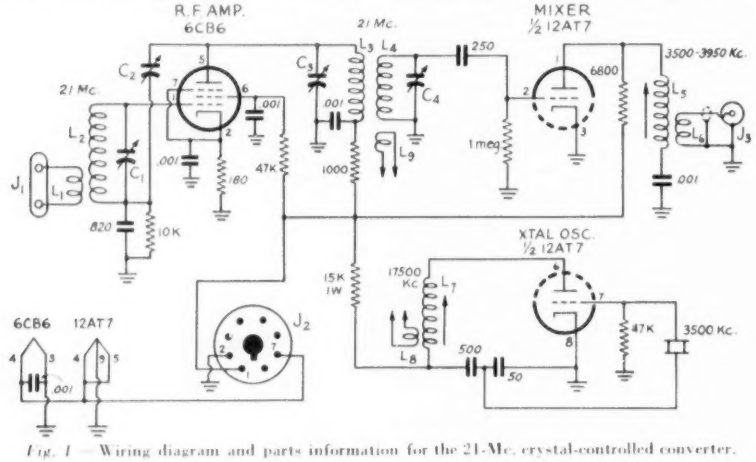
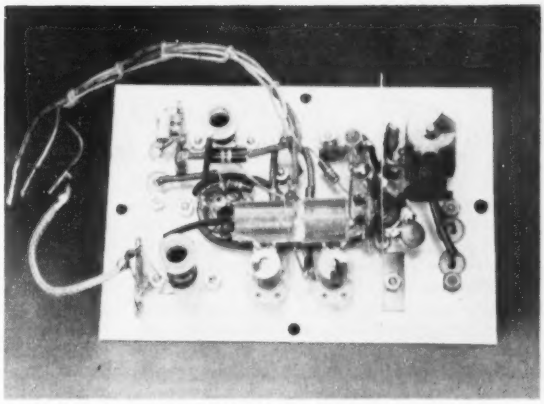


Fig. 1 — Wiring diagram and parts information for the 21-Mc. crystal-controlled converter.

C_1 — 25-$\mu\mu$f. miniature air trimmer (Hammarlund MAPC-25).
C_2 — 0.5–5-$\mu\mu$f. plastic trimmer (Erie 532-08-OR5).
C_3, C_4 — 49-$\mu\mu$f. miniature trimmer, shaft type (Johnson 20M11).
L_1 — 5 turns No. 28 enamel wound over cold end of L_2.
L_2 — 18 turns B & W Miniductor No. 3004, 2.6 μh.
L_3 — 21 turns No. 3004, 3.3 μh.
L_4 — 28 turns No. 3004, 4.6 μh.
(No. 3004 is ½-inch diam., 30 t. No. 24 tinned per inch.)
L_5 — No. 30 enamel close-wound 1 3/32 inches on ⅜-inch iron-slug form, 110 μh. (National XR-93).
L_6 — 10 turns No. 28 enamel close-wound over cold end of L_5. Wrap L_5 with one turn of plastic tape before winding L_6.
L_7 — No. 30 enamel close-wound 15/32 inch on ⅜-inch iron-slug form, 8 μh. (National XR-91).
L_8, L_9 — Single-turn loops of fine insulated wire around cold ends of L_7 and L_4. Make loops and connecting link from single piece of wire.



Interior view of the 21-Mc. converter, made by tipping back the cover plate from the position shown in the assembled view.

holes for the smaller components are on two lines each $\frac{7}{8}$ inch in from the edges. This arrangement makes it necessary to file out portions of the folded-over edges on the chassis to clear all the parts as the converter is mounted on the chassis, but it allows plenty of room for wiring work.

The r.f. socket mounting holes are in a line perpendicular to the centerline of the cover plate, with Pins 1, 2 and 3 on the right side of the copper shield. The latter is cut out to clear the socket and the shielding ring at the center of the socket is soldered to the copper.

The rotors of the r.f. plate and mixer grid trimmers are grounded directly to the base plate, but the rotor of the input tuning capacitor must be insulated from ground to provide for the neutralization system. The neutralizing capacitor is a small plastic trimmer designed for mounting on a metal plate with the rotor connection grounded, but in this case it is insulated from ground by soldering the mounting clip to the lug on a small tie-point strip. The adjusting screw projects through a hole in the plate to permit changing the setting when the converter is assembled.

The coils L_3 and L_4 are mounted in line with their cold ends toward one another and about $\frac{1}{8}$ inch apart. A piece of stiff wire soldered to the rotor connection of C_3 serves as a support for the cold end of L_4 and for the by-pass condenser at the cold end of L_3. Two-lug tie-point strips support the capacitors in the oscillator feed-back network, the i.f. and output leads in the mixer plate circuit, and the terminations for the heater and B-plus cable.

In wiring the converter, complete all the work on the plate itself before attaching the power and output cabling. The three-wire power cable is about 7 inches long, and the coaxial output lead is about 4 inches. The latter can be a piece of shielded wire, for flexibility. Arrange these leads so that when the converter is mounted on the chassis the leads will bend around the sides of the case away from the r.f. coils.

Adjustment and Operation

With the power connections shown, the plate voltage for the converter is taken off the voltage-regulated source in an HRO-7 through its accessory socket. The current drain is less than 10 ma., which turned out to be within the capabilities of this particular receiver. With others it is well to check and see if the regulator tube will handle the extra drain. The plate voltage is not critical, and anything between 150 and 250 volts should be satisfactory. If the receiver does not have a voltage-regulated supply or if the regulated source is incapable of handling the converter current drain, the power may be taken off the main B-plus line. The screen of the output tube is usually a good place to get at the supply. Consult your receiver service manual circuit diagram for other points if this is not convenient. The heater voltage can be taken off at any 6.3-volt tube socket.

If you prefer to avoid operating on the receiver in any way, a power supply can be built into the converter easily. Small selenium rectifiers will handle the necessary current drain, and information on such supplies can be found in any recent edition of the ARRL *Handbook*.

In adjusting the converter we start with the oscillator. Apply plate voltage to the oscillator through the 15,000-ohm dropping resistor, but leave the other stages without plate voltage. Connect a low-range milliammeter in series with the plate supply and watch the current drain as the slug in L_7 is adjusted. There will be a drop in plate current when the stage goes into oscillation.

Check the frequency of oscillation to be sure that it is on the 5th overtone, 17,500 kc. This can be done readily as nearly all receivers will tune to this frequency. Move the core stud and check for any marked shift in frequency. If the change is more than a few thousand cycles the oscillator may not be crystal controlled. Self-oscillation is an indication of too much feed-back.

Regeneration is controlled by the capacity divider connected between plate and cathode. Adding capacitance below the point at which the crystal is connected increases the feed-back. The values shown have worked with all 3.5-Mc. crystals tried here, so adjustment is not particularly critical. Be sure you have the right overtone,

(Continued on page 104)

What's with Your Log?

Hints and Kinks on Log Keeping

BY LEWIS G. McCOY,* W1ICP

WHENEVER any hams visit the writer's station for the first time, they always show a great deal of interest in his logbook of a clipper ship that sailed the seas in the early 17th century. The old weather-beaten log is written in neat precise script, and it gives a detailed description of each day's happenings. Not only is information given on the daily latitude and longitude but, in addition, every interesting bit of news is described in detail. When one reads the logbook, with its vivid descriptions of such things as violent storms and encounters with schools of dolphins and flying fish, there is a strong feeling of actually being present on the voyage.

The reader of this article will probably wonder what connection there is between a ship's log and amateur radio, but the connection will become apparent in a discussion of amateur log-keeping.

Although amateur radio is one of the very few hobbies regulated by federal laws, there actually are few things we are *required* to do. Our methods of operation, types of emissions, hours of operation and many other facets of the hobby are left to our own choosing. However, one of the things we "must" do is to keep a log of certain details of our station's operations,

so that if the need should arise, the FCC will have access to a written record of a station's activities.

The FCC requirements are not difficult to meet. The address, the signature of the operator, type of emission, the input power to the final amplifier, the band in use, call sign of the station called, date and time of each transmission, and message traffic handled, must be entered in your log. Some of the above information need only be entered in your log once. If you don't change bands and use only one type of emission and one value of power, the only information that must be recorded is the station called or worked, and the date and time. Further information on the legal requirements of log-keeping is given on the first page of the ARRL logbook.

What we hope to accomplish here is to pass along some tips to the newcomer so that his log will always prove to be more than just a record of "calling and ending" times. The FCC requires certain information to be noted in the log. We can add to or embellish the log as we see fit.

Other Information

The ship's log recounted the adventures of a ship's voyage. A station log can serve

to record your adventures in amateur radio. That first DX station worked, or that feeling of doing something worthwhile in an emergency — these and countless other experiences can be detailed in your log.

If you were to ask most old-timers what type of rig they were using in such and such a year, they probably would be at a loss to remember. However, there would be a few who could tell you exactly what they had simply because they kept a record of their equipment. And what better place is there than the log for keeping a record of the equipment being used at the time?

It won't take a newcomer long to realize the importance of accurate station records as he piles up experience in the hobby. One good example of this is QSL card exchanges. A contact is made and the information is entered in the log. Three months later you receive a QSL from the station you worked. Did you send him one of yours? Why not look in the log and see? That's where all the information on the contact will be. A simple check mark will show if you did or did not QSL.

Other interesting and important information is an up-to-date record of circuits and circuit changes. There isn't much need to point out how irritating it is to run into trouble with

* Technical Assistant, *QST*.

your rig and then not be able to find the circuit diagram of the equipment involved. This need not happen if the diagrams are kept as part of the log. They can be drawn on separate paper and glued or inserted into the logbook, or sketched on the blank side of the log pages.

In addition to the things already outlined, there are many other pieces of information that could be kept in the log. For example, many amateurs get a lot of fun out of trying different antenna systems. When a new antenna is erected at your QTH your log could show such information as the type of feed line used, the height above ground, orientation, the antenna proper, and, particularly, the problems encountered in getting the system to perform properly. Other information worth noting would be field patterns, and effectiveness of the system on other bands if it is a multiband job. Also any matching problems and the standing-wave ratio information could be entered in the log.

Photographs of your station can be kept in your logbooks, and they will do much to enhance the record of your activities.

Many times during on-the-air contacts you'll run across a fellow ham who is using some little gimmick that helps his receiver, or transmitter, to do a better job. You ask him for a description or circuit diagram of the gimmick and he passes it along to you. You put it on a piece of scratch paper and set the description aside. Later on, maybe the next day or so, you are working someone else and taking notes on what he has to say. Having momentarily forgotten the gimmick diagram, you use the other side of the paper containing the description for notes on your present QSO. Come clean-up time, all the notes and scribbled paper littering the operating desk are thrown out, including your gimmick diagram. When you finally remember, the diagram has long since departed with the trash collector. You know doggone well that you're not going to discard your log, so wouldn't it be a good idea to enter such information there?

A very large number of newcomers set their sights on an ARRL Worked All States award. Many times in your quest for getting all the states you'll call a ham in a new state but fail to raise him. A lot of future grief can be saved if you make it a point to list the state by name and then circle the whole thing with red pencil.

• Does keeping a station log seem to be just a necessary evil? If so, it's even money you will change your mind after reading WHCP's observations on the subject.

Also, it sometimes helps to mark down the frequency or dial setting of your receiver where you heard the new state. In this manner, you'll firmly implant the call you're looking for in your memory and, in addition, have a written reference if you need it.

There are different methods of entering the time of a contact in your log. You can do it with the regular A.M. and P.M. designations, or with 24-hour time. For those that don't understand 24-hour time, 1 A.M. is 0100, noon is 1200, 1 P.M. is 1300, and so forth. Midnight is 0000, and one minute before midnight is 2359. Many amateurs prefer 24-hour time because it is considerably less confusing than the A.M. and P.M. system.

When visitors come to your station their names and calls can be entered in the log. Of course, if visiting hams operate the rig they must sign the log as required by FCC regulations. But even if they don't operate, it's still nice to have a record of all visitors.

There will probably be many other things you'll want to enter in the log from time to time. The important consideration is that if you once form the automatic habit of keeping your records and notes in the logbook, you'll be preserving all the information that is important to you. Think of your log as a diary of all your amateur activities, and as the years go by, you'll get a lot of satisfaction (and probably a lot of laughs) from reading your early notes.

Strays

The passing of Howard L. Stanley, ex-2FS, as noted in this month's Silent Keys, will sadden the heart of many an old-timer. One of ARRL's earliest directors, Mr. Stanley served on our Board of Direction prior to the first World War. His contributions as a *QST* author were numerous throughout amateur radio's youth and the signals of Long Island station 2FS were familiar far and wide.

—···—

Would your school club like to have a list of other school amateur radio clubs? Forty-seven such clubs responded to a previous *QST* Stray requesting organizational information and are listed in this, the first roster. Write to Willis C. Brown, U. S. Office of Education, Washington 25, D. C., asking for "School Amateur Radio Club Information Sheet." Fill it out, return it, and your school will be listed in a forthcoming issue sent free to school ham clubs.

W2KE writes that he worked **ZD4BF** (14,125) one afternoon, and the ZD4 asked him to stand by for a try of s.s.b. Although W2KE was using "an old SX-10 (1936)" for receiving, he was able to pick out parts of the 10-watt s.s.b. signal. Which is all by way of announcement that there is one more country on the air with s.s.b., and we suspect that 4BF will be boiling through with more than 10 watts before you get to read this.

Here's a letter that speaks for itself, from Harlan Dewitz, **WØDHO**, president of the North East Nebraska Radio Club:

"The NENRC, a very active radio club since 1938, now has fourteen members and 86 per cent of them are on s.s.b. It will soon be 100 per cent, which we think would be rather rare. The members are from 8 towns and, since s.s.b. is the rage, the attendance has been almost 100 per cent at every meeting. Meetings are once a month except in summer. Of this 86 per cent, two of the members have s.s.b. mobile.

"I might mention that at the end of 1952 there were four s.s.b. stations in Nebraska as compared to the present total of 26, which is quite a gain for one year. Is s.s.b. the coming thing? Ask any of the above."

The February issue hasn't been out long enough (at this writing) for us to have any reactions on the suggested informal s.s.b. DX contest mentioned in that issue. But don't forget to let us know what you think about the idea.

Using the Viking I with a Crystal-Filter Exciter

Close on the heels of W4JMU and his dope on how to use a 10A Exciter with a Viking (January) is Mark Cholewski, K6CRT, ex-W8SVK, with his story of how he uses a Viking I with an Edmunds crystal-filter s.s.b. exciter. The basic idea is to use the oscillator portion of the Viking (crystal or VFO) to beat with the s.s.b exciter output at, say, 450 kc. and then drive the Viking output stage with the resultant signal. Another objective, of course, is to do this without cutting into the Viking enough to lower its resale value. The revised diagram is shown in Fig. 1 — here are the changes in Mark's words:

"1. Add a 10-$\mu\mu$f. ceramic in series with the plate of the 6AU6 oscillator, through a short piece of coax to a coax connector that is mounted in the angle, under the cover, supplied in the TVI suppression kit.

"2. Add a 3-turn link on the 6AQ5 buffer coil placed at the top end of the coil. Run the twisted pair to two lead-through insulators in the angle mentioned in Step 1.

"3. Add a 0.01-μf. ceramic to R_{26} to bring the B+ side of the buffer coil to an r.f. ground. The 0.005-μf. seemed not capable of doing the job well enough.

"4. Add a swamping resistor (4700 ohms, 2 watts) across the r.f. choke L_6 and resistors R_{24} and R_{27}.

"5. Replace resistor R_{17} with resistors R_1 and R_2 indicated in the modification diagram. These two resistors should total, in series, 2700 ohms. The value of R_1 will depend on the class of operation that one wants to run the 4D32. Look up the recommended value of bias (E_g) for the 4D32 operating this way (same as for audio work) and solve in the formulas:

$$R_1 = 5000 - 67\,E_g \quad R_2 = 2700 - R_1$$

"6. Add two VR-150s across the resistor R_{13}. The VR-150s can be mounted horizontally on a small bracket fastened to the TVI kit shield above and behind the crystal socket.

"7. Rewire the heaters as shown in Fig. 1, by adding S_{1D} in series with the hot side of the heater winding and the tubes shown. Thus the following will always be connected to the heater winding: pilot light, Pin 7 of VFO socket, 6AL5, 4D32 and 6AU6.

"Following the described steps, one should have no trouble increasing his s.s.b. power to approximately 200 watts peak input. These changes retain −20 and +300 available at the VFO socket, either or both of which can be used to power the s.s.b. exciter. Remember that on s.s.b. the C.W./Phone switch is set in the 'C.W.' position.

"One factor left for the individual to 'engineer' is the placement of the switch S_1. Its location is important, since short leads are required in the grid circuit of the final. At

(*Continued on page 112*)

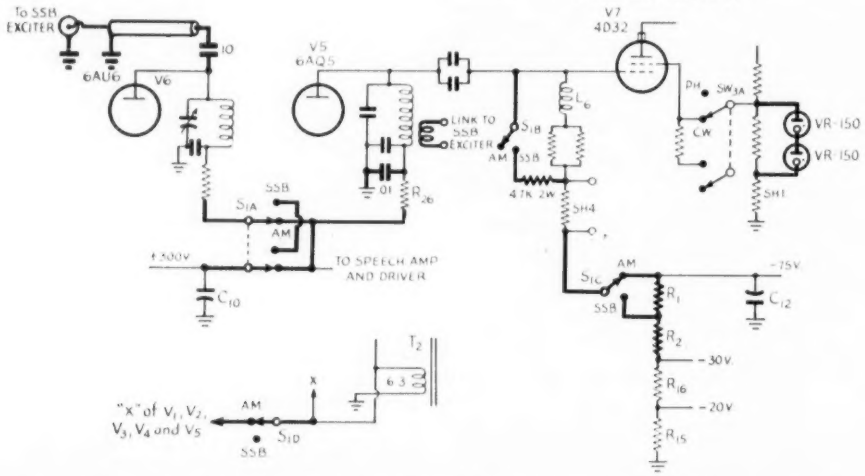


Fig. 1 — K6CRT revised his Viking I to work as a linear following a crystal-filter s.s.b. exciter. The heavy lines represent the changes in the original Viking circuit.

Break-In with One Antenna

A Complete C.W. Control System with No Relays

BY T. H. PUCKETT,* W2JXM

• Here is an approach to c.w. break-in that deserves the attention of any and all c.w. men interested in perfecting the operation of their stations. Unlike most articles of this type, this one describes an entire system, solving not one but all of the problems in connection with operating and monitoring full break-in with one antenna.

THERE are several technical problems peculiar to amateur c.w. operation that have been attracting attention for some time. These include keying the oscillator for break-in, shaping the transmitter output for a pleasant sounding and easy-to-copy signal, monitoring the transmitter output, and protecting the receiver input. If the literature is examined, it will be found that there are many good ideas for solving the various problems one at a time. However, if really convenient operating is to be obtained simultaneously with a decent sounding signal, it is necessary to consider all of the problems at once. This complicates things, and the results have often been far from satisfactory. Probably the best scheme to date has been the "De Luxe" keying that has been in the *Handbook* for the last few years. It has its disadvantages though, such as requiring a rather special relay and having to use a separate antenna for the receiver.

After meditating on this situation for about a year, certain steps were taken and the unit to be described was the end result. For those of little cash, it uses five tubes, costing about eighteen dollars. To balance this it has the following particular advantages:

1) It should be a satisfactory control unit for almost any transmitter.

2) The transmitter keying characteristic is independent of the oscillator keying characteristic and the transmitter keying may be adjusted by a grid-block keyer without worrying about its effect on the oscillator.

3) The break-in action is extremely smooth (people using the unit for the first time have insisted that only a low-level oscillator was being controlled).

4) The receiver input is protected from the r.f. output of the transmitter.

5) There are no adjustments to be made once the unit is initially installed.

6) The frequency of operation does not matter as long as it is in the 3- to 30-Mc. range.

7) Only one antenna is required for both the receiver and the transmitter.

* % Columbia University Electronics Research Laboratory, 632 West 125th Street, New York 27, New York.

This is a pretty impressive list of claims, but it is felt that they are justified. Against these must be charged two further minor requirements. First, a matched coax line between transmitter and antenna coupler is absolutely necessary, and it must be of the 50-ohm variety if more than 500 watts or so input to the final is used. Second, three supply voltages are needed, although only small currents are required.

The Circuit

The primary elements of the complete transmitter-receiver-control unit system are:

a) The oscillator, VFO or otherwise.

b) A grid-block-keyed amplifier stage (which may be the transmitter final in low-power installations).

c) The receiver, which must be modified to allow controlling its gain by inserting an additional resistance in series with the r.f. gain control.

d) An antenna switch that disconnects the receiver input from the matched transmission line when the key is closed.

e) The necessary circuits to control the system.

These are indicated on Fig. 1 [next page], the schematic of a particular complete system. The section labeled "Control Unit" will ordinarily be the same regardless of the other sections. The other sections shown are taken from the installation at W2AEE, where the major portion of the experimental work was done.

Operationally speaking, the unit is closely related to the "De Luxe" keying system, even though the two circuits bear little resemblance. When the key is open, the oscillator is turned off, the grid-block stage is cut off by the keyer tubes, the receiver r.f. input is connected to the transmission line from the antenna coupler and the receiver gain is at its normal value. When the key is closed, the oscillator will turn on, the receiver will be disconnected from the transmission line, and the receiver gain will be decreased. Then the grid-block stage will turn on and pass the oscillator signal through to the antenna.

There are a couple of points to observe about the action described so far. First, turning the oscillator on quickly will cause it to have clicks. However, these do not reach the transmitter output as the grid-block stage turns on much more slowly. Also, the receiver gain will be decreased before there is any substantial output from the transmitter, so a replica of the transmitted signal will be heard.

Now when the key is opened, the grid-block stage starts to decrease the transmitter output at a more or less gradual rate, but the oscillator

stays on and the receiver antenna is left disconnected and the receiver gain kept low. This condition holds (even though the key is up) until the grid-block stage has reduced the transmitter output to a small value, at which time the oscillator turns off, the receiver is reconnected to the antenna, and the receiver gain is restored to normal. There may be a click or chirp in the oscillator output when it is turned off, but it does not reach the antenna.

It might be noted that this method of operation may allow the oscillator clicks to be heard in the local receiver under some conditions, but they will rarely be serious. An audio limiter should take care of them nicely if they are loud enough to be annoying. Also, line voltage changes and other transients may cause undesirable effects such as a chirp in the receiver, even though the transmitter output is perfectly clean. This effect is probably caused by the transients getting into the receiver b.f.o. or h.f. oscillator, giving a momentary change in frequency. However, the effect is not unique with this control scheme, as the limitation is basically with the receiver and its overload characteristics.

A question worth considering at this point is "Will it be possible to turn the transmitter on without disconnecting the receiver, and if so, how serious is it?" Well, the circuitry is so designed that except for some extremely unlikely circuit failures, the transmitter cannot be turned on without first disconnecting the receiver from the antenna. Also, if the circuit should fail in the fashion mentioned as unlikely, about the only thing likely to be damaged is the 6AJ4 tube that serves as the antenna switch.

Circuit Details

To follow the operation of the circuit, first consider conditions after the key has been open awhile. A large negative voltage will appear at Pin 2 of the 12BH7, cutting off that section of the tube. This will allow Pin 1, the corresponding plate terminal, to rise toward the +300 volt supply. The grid of the second section of the 12BH7, Pin 7, is connected to Pin 1, so it will also be pulled toward +300. This second section is connected as a cathode follower, so it can be taken that its cathode, Pin 8, will be at its grid's potential and so also rise to a high potential.

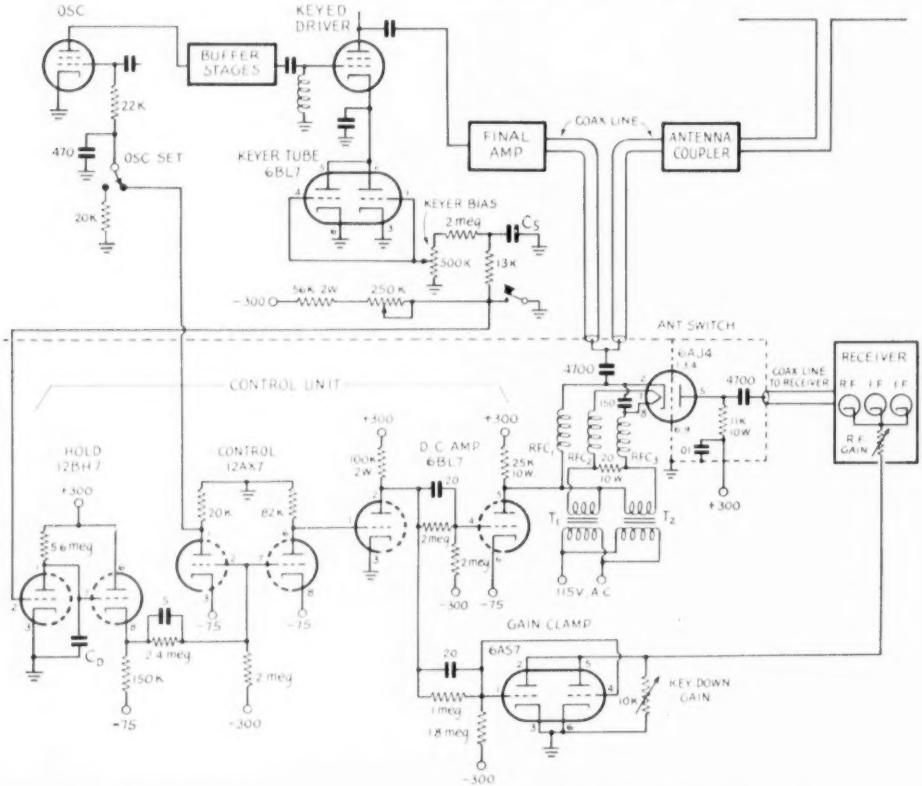


Fig. 1 — The complete break-in keying system.
C_D, C_5 — See text.
All resistors ½ watt unless specified otherwise.
RFC_1 — 2.5-mh. r.f. choke, 125 ma.
RFC_2, RFC_3 — 2.5-mh. r.f. choke, 300 ma.
T_1, T_2 — 6.3-v. 1.2-a. heater transformer.

This high potential at Pin 8 of the 12BH7 is coupled through a divider network to the grids of a 12AX7. (The capacitors shown here and elsewhere in the circuit on the grid divider networks are just to speed up the action a little, and do not affect the fundamental operation of the circuit. It would probably work just as well without them.) The effective positive-going signal coupled to the 12AX7 grids will cause both sections to conduct, giving a *negative* voltage at the plate terminals, as the cathodes go to − 75 volts and the plate load resistors return to ground. The voltage at Pin 1 of the 12AX7 is about − 15 volts, and goes to the grid return of the oscillator, biasing it past cut-off and thus keeping it from oscillating.

The voltage at Pin 6 of the 12AX7, about − 40 volts, goes to the grid of a 6BL7 section, biasing it past cut-off. The 6BL7 plate, Pin 2, will therefore rise toward + 300. This plate is coupled to the grid of another 6BL7 section (the other half of the same envelope) and to the grids of a 6AS7.

The 6AS7 will conduct under these conditions, and act as more or less of a short circuit across the 10,000-ohm key-down gain control. The receiver will then be operating with normal gain, determined by its internal r.f. gain control.

The second half of the 6BL7 has the same positive-going signal coupled to its grid, Pin 4, and will conduct heavily. As it is nothing but a glorified cathode resistor for the 6AJ4 tube, it will allow the 6AJ4 to conduct at the same time. The 6AJ4 is connected as a grounded-grid amplifier between the transmission line and the receiver r.f. input, so under these conditions it will pass any signals on the line through to the receiver.

When the key is closed, the 6BL7 grid-block keyer will gradually turn on. Before the keyed amplifier stage gets appreciably turned on, however, the oscillator and the receiver will be controlled. The closing of the key will cause the voltage at Pin 2 of the 12BH7 to fall to zero extremely rapidly. This will allow the section to conduct, and its plate potential will fall quite rapidly as the capacitor C_D is discharged through the low plate resistance. This fall in potential is coupled through the cathode follower section to the grids of the 12AX7, cutting off both sections. As the current through the plate load resistors of the 12AX7 falls to zero, the voltage at the plate terminals will also fall to zero. Thus the bias that was fed to the oscillator grid from Pin 1 of the 12AX7 will be removed, and the oscillator will turn on.

Cutting off the 12AX7 also removes the negative bias from Pin 1 of the 6BL7, and allows that section to conduct. This will cause its plate potential to drop, which will in turn be coupled into the second section of the 6BL7 and into the 6AS7, cutting them off. Cutting off the second section of the 6BL7 will cause the current through the 6AJ4 to fall to zero, killing its amplifier action and therefore decoupling the receiver antenna input from the transmission line (except through the very small cathode-to-plate capacitance of the 6AJ4). Cutting off the 6AS7 will remove the short from across the key-down gain control, which will reduce the gain of the receiver to an amount dependent on the setting of the control.

Thus the oscillator will be turned on, the receiver antenna input disconnected, and the receiver gain decreased before there is any substantial transmitter output.

When the key is opened, almost the inverse action takes place. The important difference is that the receiver and oscillator switching does not take place until after the grid-block stage has substantially turned off.

When the key was closed, C_D was discharged very rapidly by the plate resistance of the 12BH7. But when the key opens, there will be a very rapid negative jump in voltage at the 12BH7 grid which will immediately cut it off. (This jump in voltage is always some fraction of the total blocking bias used, and can be observed across the key of any grid-block keyer. Note, however, that it does not appear at the grids of the keyer tubes. The waveform there is the familiar smooth exponential.) Cutting off this first section of the 12BH7 will cause the plate to rise toward + 300, but now the rate of change of the plate potential will be much slower than it was when the key was closed, as the necessary current to charge C_D must be supplied through the 5.6-megohm plate load resistor. Thus by controlling the magnitude of C_D, we can get any desired time delay between when the key opens and when the receiver and oscillator go back to their key-up conditions, without disturbing the necessary rapid action when the key is closed.

An essential element of this delay action is the use of a high-μ tube such as the 12AX7 for the second envelope in the control unit. This is necessary so that a sharp action can be obtained when the 12BH7 plate potential reaches some particular point. Otherwise, the slow rate of change of the 12BH7 plate potential would cause a relatively slow action of the system when it changed from the key-down to the key-up condition. It can be seen that a quick action will be obtained when it is considered that the 12AX7 grids receive a total swing from the 12BH7 of about 115 volts, and it only takes about 1.5 volts to drive the 12AX7 from cut-off to full conduction.

Circuit Modifications

It would be quite unusual to find that the circuit shown in Fig. 1 would be directly usable in some particular installation. So let's consider likely modifications of the sections other than the control unit.

First, there is shown an "Oscillator Set" switch. This is useful for setting the oscillator frequency without turning the entire transmitter on. However, as the frequency of the oscillator is determined to some degree by the value of its grid leak resistor, it is necessary that the total grid leak resistance remain the same for both

positions of the oscillator set switch. It is therefore necessary to use two closely matched resistors for the plate load of the first section of the 12AX7 and for the substitute resistor switched in for setting the oscillator. Their absolute value is not important, but they should be matched. If this feature is not desired, just about any 18,000- or 22,000-ohm carbon resistor would do for the 12AX7 plate load.

In the circuit shown, the oscillator grid leak is split into two approximately equal parts. This is more or less arbitrary, and if it is found that the 15 volts or so bias developed at Pin 1 of the 12AX7 is not adequate to cut off the oscillator completely, which might occur for high screen or plate potentials, the ratio can be changed to put more of the resistance in the plate circuit of the 12AX7. It's hard to say how far this can be safely carried, but a reasonable guess might be to keep at least 10,000 ohms directly in series with the oscillator grid circuit.

The grid-block keyer shown has an extra voltage divider circuit not normally found in such circuits, with a 0.5-megohm potentiometer labeled "Keyer Bias." If this were not used, and the full −300 volts keying bias were applied directly to the 6BL7 keyer tube(s) grids, undesirable effects could occur when controlling amplifier stages with low plate supply voltages. This is because the amplifier plate supply voltage determines how much blocking bias is needed at the keyer tube to turn the stage off, the bias required increasing as the plate supply increases. If too much bias is used, a part of the exponential change at the keyer tube(s) grids is lost. This results in a sharpening of the keying characteristic. The "Keyer Bias" adjustment eliminates this effect. It is set by removing the 12AX7 from its socket, which will turn the oscillator on, and adjusting the pot until the transmitter output just falls to zero. This may be a rather broad adjustment, with no clear-cut point at which the output goes to zero. In that case, it won't matter too much anyhow. (If the keyed stage is also the final stage of the transmitter, it may be better to adjust the potentiometer to just kill the noise heard in the receiver from the final-stage plate current which, though small, has large noise-generating potentialities.) The circuit as shown should be adequate for amplifier supply voltages up to about 350 volts.

No comment will be made here about the process of adjusting the grid-block keyer, as the topic has been pretty well covered in the past. The *Handbook* contains an excellent discussion. The rest of the control circuitry may be disabled when adjusting the keyer by removing the 12AX7 from its socket.

The final modification to be mentioned has to do with controlling the receiver gain. In certain receivers, for instance the Collins 75A-2, the r.f. gain control varies a negative bias applied to the grids of the r.f. and i.f. stages of the receiver. This is in contrast to the method shown in Fig. 1, where the r.f. gain control is in the cathode circuits and effectively controls a positive voltage. For the case where a negative voltage is controlled, the 6AS7 should have its plate terminals connected to ground and the cathodes connected to the receiver's gain control.

Control-Unit Adjustment

The only adjustment in the control unit proper is C_D. To find the proper value, start with something like 0.05 μf. and gradually decrease its size until it is noticed that the break keying characteristic is being clipped by the oscillator turning off too soon. (Obviously, the grid-block keyer must be adjusted first.) Pick a value of C_D just a little larger than the value which starts to cause clipping, and the adjustment is completed.

Practical Pointers

It should be kept in mind that parts of this system have to operate rather rapidly, so the stray capacitances should be kept as small as possible. This primarily means that you shouldn't put half of the circuitry in the basement and the other half in the attic. The most critical points are the 12AX7, 6BL7, and 6AS7 grid leads. The components that go to these terminals should be mounted in the immediate vicinity, so that short leads may be used.

If an r.f. click filter is used at the key, any capacitors that are connected across the key should be kept much smaller than C_S, the shaping capacitor in the keyer. The ratio should be at least 10:1.

The physical construction of the 6AJ4 stage should be such that the plate circuit, which feeds the receiver input, is completely shielded, so that the only coupling is through the 6AJ4 itself. A metal shield should enclose the 6AJ4 plate terminal and the receiver connection, which should preferably be coaxial. The shield can cross the 6AJ4 socket directly across the grounded grid terminals. The lead from the 6AJ4 plate resistor should be by-passed where it leaves the shielded enclosure.

The coaxial transmission line between the antenna coupler and the transmitter should pass directly through the control unit, as shown in Fig. 1, rather than reach the unit through a "T" connection. The "T" connection may cause resonance effects, giving a key-down voltage at the control unit of more than the 200 volts r.m.s. that is the maximum allowable for proper operation. This 200 volts, by the way, corresponds to 800 watts in a matched 50-ohm line, and 570 watts in a 70-ohm line.

It may be possible in some cases to replace the 6AS7 by a cheaper 6BL7. To find out, just replace the 6AS7 with a 6BL7, and check to see if the receiver maximum gain is decreased too much.

It is necessary to feed the 6AJ4 filament in the manner shown in Fig. 1 to keep within the heater-cathode rating. With the National R-300S chokes used, about 15 volts of heater supply voltage was needed because of the drops in the resistance of the chokes. The particular trans-

Continued on page 108)

R.F. Amplifiers for 420 Mc. Using the 6AN4

Improved U.H.F. Reception with Standard Components and a Low-Cost Tube

BY B. D. LEE,* W5AYU, AND R. J. LOOFBOURROW,* W5HPC

THE 420-Mc. grounded-grid amplifier described herein was adapted from a design for u.h.f. TV service originally described in a Sylvania Engineering Information Service Bulletin.[1] The simplification resulting from narrowing the tuning range of the original model makes possible an amplifier that can be duplicated readily by the average ham.

Several versions have been built. The first, by W5AYU, used the developmental tube Type SR1553D, later introduced on the market as the 6AN4. It was built under a chassis and incorporated in a crystal-controlled crystal-mixer converter.

Later, a similar under-chassis design using two stages was used in conjunction with a converted surplus BC-645 radar-type receiver. A drawback in these first models was inaccessibility of the first stage, it having been sealed up by soldering in the process of adding a second stage. The models shown in the photographs represent an attempt by W5HPC to make a somewhat simpler unit that could be worked on more readily.

The amplifier described requires only the simplest tools for construction, and it uses standard commercial parts. With the dimensions given, the frequency range is approximately 400 to 500 Mc., with the 420-Mc. band falling near the middle of the 180-degree tuning range of the small variable condenser.

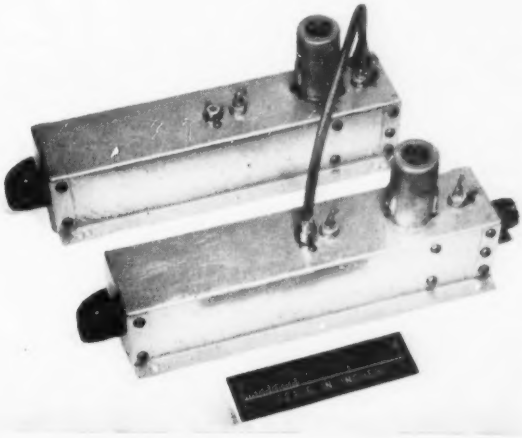
Need for R.F. Stages at 420 Mc.

There is a definite need for one or more r.f. amplifier stages to improve the noise figure of 420-Mc. mixer stages. The noise figure of any mixer at this frequency is bound to be rather high. There is little choice between the best triodes and silicon crystal diodes as 420-Mc. mixers, though the experience of the writers indicates that better noise figures are obtained more readily with silicon diodes. Pentodes have extremely high noise figures and should be avoided entirely in u.h.f. mixer service. It should be remembered that any u.h.f. mixer needs a low-noise i.f. amplifier to back it up. One r.f. stage can improve the over-all noise figure of the system by as much as 10 db., but two or more stages may be needed with ineffective mixers. It should be noted that the first stage of any receiver will control the over-all noise figure only if it has enough gain to overcome the noise figure of the following stages. If the gain of the first stage is lower than the noise figure of the second stage, the latter will contribute appreciably to the over-all noise figure.

A noise figure of 6 to 7 db. is obtainable readily using one r.f. stage like the one described, in conjunction with a crystal mixer and a following low-noise i.f. amplifier. Two such stages will be required ahead of most triode mixers, and the same two stages may result in an overall noise figure of 10 to 12 db. when used with very poor receivers like the APS-13 and BC-645. The effect

* % The Texas Company, Producing Dept., Research Division, Bellaire, Texas.

[1] Boden, "A Practical R.F. Amplifier Tube for the U.H.F. Television Channels," Sylvania Engineering Information Service, Vol. 1, No. 3, January, 1952.



Two-stage 6AN4 r.f. amplifier for 420 Mc. The stages are identical except for the position of the coaxial input connector.

of using even one stage ahead of such a receiver is truly astounding. Weak modulated-oscillator signals, normally unreadable, become "Q5," and with two stages one begins to appreciate that even these very broadband receivers can be made to do a respectable job in weak-signal reception.

A gain of 12 to 13 db. can be realized from each properly-loaded r.f. stage. Two stages show no tendency toward regeneration when properly adjusted, and as many as four stages have been used with complete stability. This is gratifying, indeed, at a frequency where lead lengths and common current paths can cause so much oscillation trouble. Such stability is possible because the r.f. energy is kept within the confines of individual plate and cathode compartments, resulting in excellent isolation when the bottom plate is in place.

Construction

It is hoped by the authors that the complete description of the amplifiers, together with the layout drawings and photographs, will help to develop interest in 420-Mc. construction on the part of many who may have heretofore been content with the admittedly ineffective converted surplus gear that has been available for 420-Mc. use. By following the construction details and photographs carefully, even the inexperienced Novice-Technician should be able to build these amplifiers successfully. At least nine of them have been built by amateurs in the Houston area, and all have worked satisfactorily.

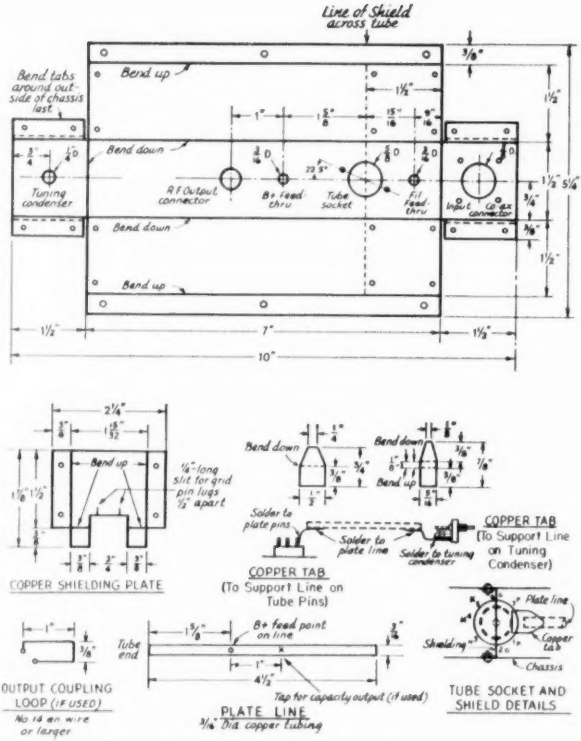


Fig. 1 — Detail drawing of the chassis and small metal parts used in the 6AN4 r.f. amplifier. All sheet-metal parts may be made of flashing copper.

Because of the ease with which it can be cut, bent or soldered, flashing copper is probably the best material for the chassis, but aluminum can and has been used in several instances. The amplifiers photographed are of sheet aluminum construction. Each is 1½ inches square and 7 inches long, a convenient size for mounting on a chassis along with other converter components.

Two methods of construction are shown. In the top view, the amplifier in the foreground has a coaxial fitting mounted on the end of the cathode compartment, whereas the other unit has its input connector on the top surface. The two arrangements were intended primarily for applications where two or more stages are to be used. The interconnecting coaxial cable is fitted with phono-type coaxial plugs, but the losses in this type of connector can be rather high, so the use of standard r.f. coaxial fittings or direct coaxial wiring between stages is recommended. The latter can be accomplished by soldering a copper disk to the outer braid of the coax, at the point where it will enter the r.f. chassis. This disk can then be bolted to the surface of the amplifier.

The Sylvania 6AN4 triode was developed particularly for u.h.f. TV grounded-grid amplifier service. It features an internal shield connected to the grid, separating the input and output sections as required in grounded-grid service. In addition, it has double plate and grid leads to reduce lead inductance, an important factor at these frequencies. At present, it is priced lower than any comparable tube, a feature not to be taken lightly by amateurs. Connections in its seven-pin base are arranged so that a shield can be placed across the center of the socket, making contact to grid pins Nos. 2 and 6 for grounding purposes. If possible, a tube socket that is made without the usual small circular shield should be used, or the shield should be removed if the socket has one.

After cutting the metal with tin shears the chassis can be bent into shape on a vise using a wood or metal block and a hammer. The holes can be punched or drilled either before or after bending the chassis. Screws are used to clamp

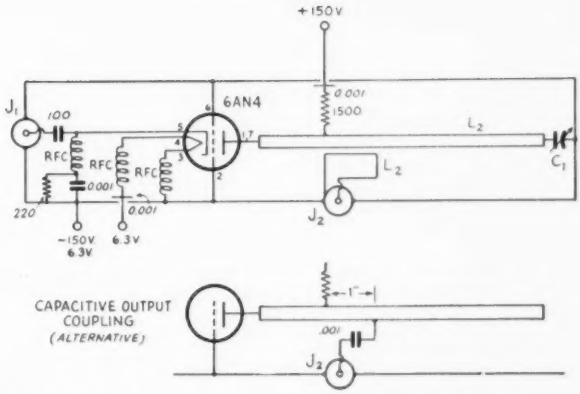


Fig. 2 — Schematic diagram of the 420-Mc. r.f. amplifier. Two methods of output coupling are shown.

C_1 — 1.5-5 $\mu\mu$f. variable (Johnson 5M11).
J_1, J_2 — Coaxial fitting.
L_1 — Plate line; see Fig. 1.
L_2 — Coupling loop; see Fig. 1.
RFC — 24 t. No. 20 enam., 3/16 inch diam., close wound.

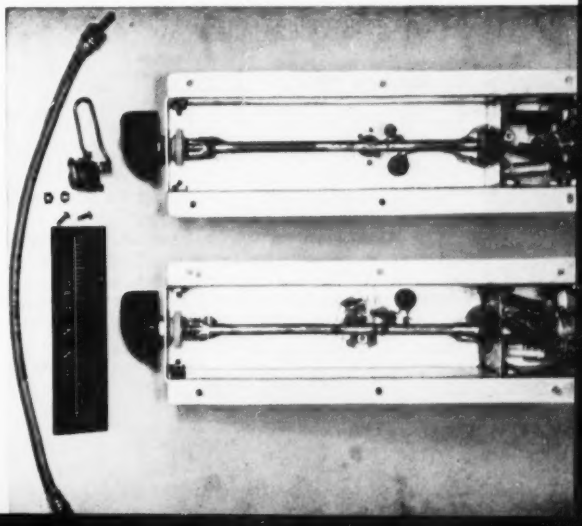
the ends of the chassis for rigidity. Mount all parts in their respective holes. A ground lug can be placed under the filament feed-through condenser for the ground on the input side. A single tie-point will be needed for the cathode bias resistor and its by-pass condenser. Wire all of the input circuit including the filaments before placing the shield plate in place across the tube socket. The copper shield plate should then be located and fitted to the particular tube socket used. The shield plate should be fastened in place with screws in alignment with grid pins Nos. 2 and 6. These pins then must both be securely soldered to the shield plate. If one is loose, the amplifier may oscillate violently.

The low-inductance tabs for supporting the plate line should be tinned carefully and bent into shape. One should be soldered to Pins 1 and 7 on the tube socket and the other soldered to the frame of the stator of the miniature tuning condenser. Avoid excessive heat on the condenser as its stator plates may loosen and shift. The plate isolating resistor can then be soldered to the plate feed-through condenser, keeping the leads short. The output coupling loop or condenser can be installed on the output socket. No particular-size hole has been specified here since several types of sockets can be used. The plate line can be installed last by positioning it on the copper supporting tabs so that it is centrally located in the plate trough and then soldering in place. The plate isolating resistor should be perpendicular to the plate line and is soldered in with short leads at a point 1 5/8 inches from the plate end of the line. It is desirable to have a bottom plate on each stage for stability. This can be a separate plate for each stage, or a large plate or chassis with several r.f. stages securely mounted on it.

It should be emphasized that the dimensions, line diameter, line length and tap positions given are for the 6AN4 tube only. They may not be the same for the 6AJ4, 6AM4, 6J4, or other tubes. At 430 Mc., the input resistance of a grounded grid 6AN4 is sufficiently low to be fed directly at the cathode with a 52-ohm line with less than a 2-to-1 mismatch.

Either inductive loop output coupling or tapped-down capacitive coupling can be used on the plate line. Both have been used and found equally satisfactory. Proper loading is required in each case for stable operation. The capacitive coupling has an advantage that some loading adjustment can be made by moving the tap along the line. It is important that the output of the last r.f. stage, regardless of the number used, feeds to an impedance which is a nearly pure resistance of from 50 to 100 ohms. Excessive reactance in the plate load will result in oscillation troubles. A study has been made of condi-

(Continued on page 110)



Bottom view of the 6AN4 amplifiers. The output coupling loop was removed from the upper unit and may be seen at the left.

• *Technical Topics* —

Single-Sideband Economy

JUDGING by the correspondence it has generated, the article comparing amplitude modulation and single sideband [1] covered a matter of considerable current interest to 'phone operators. Some of the single-sideband enthusiasts have been quick to point out that there are other aspects that ought to be included when the situation is viewed as a whole. This is true, of course — in fact, the article ended up by saying just that. Although some of these aspects do not lend themselves quite as readily to expression in terms of either watts or dollars, they are nevertheless just as worth consideration as the power comparisons discussed in January *QST*.

There are several bases on which a.m. and s.s.b. power can be compared; the one used in January *QST* was selected because we believe it represents the closest approach to the way most amateurs think of transmitter power. Another equally important comparison can be based on the size, weight, and cost of equipment, and the power consumption. These factors may be of very great importance to some amateurs and of no importance whatsoever to others. In this area you have to decide for yourself, but in order to do so it is necessary to know the considerations that enter into their determination.

Because of existing ratings on particular tubes and components, there are no rules that can be applied at all power levels. In fact, because of this situation amateur transmitters, of whatever type, are usually designed with the thought of getting the most out of particular components rather than to give a specific power output. Consequently a comparison based on power output tends to be somewhat artificial, but it happens to be about the only basis that is sufficiently general to serve as a starting point.

Some items of equipment will be essentially the same in both a.m. and s.s.b. transmitters. The voltage-amplifier stages in speech amplifiers, for example, will be practically identical. A crystal

oscillator or a VFO will be essentially the same in both cases (although they may not work on just the same frequencies). In multiband transmitters following current practice, it is probable that in both types of rig the final output frequency will be reached by using small tubes in the receiving classification, or at least tubes of comparable cost. In the a.m. multiband set the output frequency almost certainly will be obtained by a certain amount of frequency multiplication, and in the s.s.b. multiband transmitter it is almost equally certain that a conversion system will be used. So far as tube, circuit, and power supply cost go these will be about the same in both cases. The principal difference in these "low-level" parts of either type of transmitter will be the fact that the s.s.b. rig will have, in addition, the means for generating the single-sideband signal, representing a cost that will not be required in the a.m. transmitter.

This additional equipment includes a balanced modulator and, depending on which s.s.b. system is selected, either an audio phasing network or a sideband filter. Either system will require a couple of extra tubes, but the added power consumption is so small that it can easily be handled by the supply that takes care of the speech and other low-level r.f. circuits. Phasing networks are rather inexpensive, and so are the surplus crystals used in sideband filters. It seems fair to say, therefore, that while the s.s.b. exciter for multiband operation will cost more than one for a.m., the difference is not too impressive — as a guess, possibly somewhere between fifteen and twenty-five dollars.

This assumes that the exciter has a few watts output, and in the case of the a.m. transmitter the output is c.w. only, while the s.s.b. job actually is a complete transmitter. It is not entirely silly to talk about such low power, in view of the s.s.b. work that is continually going on with just such exciters, and if we wanted to stop here we would have to add to the a.m. rig the cost of some sort of low-power modulator. Even so, the a.m. cost probably would still be below that of s.s.b. at this power level, but it would be pretty hard to convince an s.s.b. man that you would not get far more communication for your money by spending the few extra dollars.

A major difference between s.s.b. and a.m. is that in stepping up to higher power levels you can forget about audio in the s.s.b. transmitter. Let us assume that either of the exciters we have been talking about is capable of driving a "100-watt" amplifier, each in its own field. The "100 watts" is defined in the same way as in the January article — that is, 100 watts of carrier output in the a.m. case and 100 watts of peak output in the s.s.b. case. The a.m. situation stacks up something like this:

1) An r.f. amplifier using a tube or tubes having a total plate dissipation of about 40 watts. This assumes better than 70 per cent plate efficiency at the unmodulated carrier level and neglects the additional plate heating that occurs when modulation is applied.

2) A plate supply capable of delivering 140 watts of d.c. power to the r.f. stage.

[1] Grammer, "The A.M. Equivalent of Single Sideband," *QST*, January, 1954.

3) A modulator having a sine-wave power output of 70 watts, minimum.

4) Filament and plate supply for the modulator, the latter capable of delivering an average of something like 70 watts of d.c. power to the modulator plates. The power capacity required depends to some extent on the type of operation (Class AB, B, etc.) and whether or not speech clipping is employed. With the latter, greater power capacity is required.

5) A driver stage for the modulator. This might take enough plate power to require a separate supply, or necessitate a larger combination supply for the r.f. exciter and the speech amplifier than was assumed earlier.

Approaching the s.s.b. case on a rather conservative basis, we have:

1) The same r.f. amplifier tubes and circuit components as for a.m. The plate efficiency at peak output probably will be somewhat lower than the carrier efficiency of the a.m. rig, when the linear amplifier is adjusted for good performance, but the plate dissipation can easily be kept within the tube rating because of the intermittent nature of speech.

2) A plate supply capable of delivering approximately 100 watts of d.c. power.

These figures are only estimates, of course, but they should be close enough to the truth to be useful. In general, they have been weighted in favor of the a.m. side. The a.m. modulator plate supply and the s.s.b. linear plate supply are assumed to be required to furnish only an amount of power equal to the actual output delivered by the respective amplifiers; in view of experience this seems about as reasonable an estimate as any, although in both cases it is subject to modification by actual choice of operating conditions. In the a.m. transmitter, the r.f. and modulator supplies might be combined; here is one of those cases where practically everything depends on what components are available. Usually, however, it turns out to be better to use separate supplies. In any event it is necessary to provide approximately twice the total plate-supply power capacity for a.m. as for s.s.b., and while the relationship between d.c. watts and dollars is not actually direct, it does tend in that direction.

In operation, the 140 watts for final stage of the modulated a.m. rig is consumed all the time the transmitter is on the air. The average power consumption of the modulator with speech might be around 35 watts. The average power consumption of the s.s.b. linear might be 50 watts or so during transmitting periods, so the total plate power consumption might be estimated to be about as follows:

	A.M.	*S.S.B.*
Exciter	40	40 watts
R.F. Amp.	140	50
Modulator	35	
Driver	20	
Total	235	90

Filament power consumption should be added, and will be higher in the a.m. case by the additional audio and rectifier tubes required in the particular set-up. Even in this fairly low-power case of a 100-watt transmitter the power consumption of the a.m. rig is at least twice as great as for s.s.b., and the ratio is more nearly in the neighborhood of four to one at higher powers where exciter and filament power is a smaller proportion of the whole.

The saving in space, weight, and cost in favor of single sideband should be obvious. The somewhat higher cost of s.s.b. at very low power levels

is quickly overcome as higher power is considered, and by the time the 100-watt level is reached the advantage is all with s.s.b. It is even more convincing at still higher powers.

What you pay the power company for the power your ham rig consumes may not be especially important to you, although it is not inappreciable. However, saving power may mean a lot in other ways — less line drop, and perhaps eliminating the necessity for special a.c. lines to the shack. Also, in portable and mobile work the saving in space, weight and power consumption can be very attractive.

For the same "talk power," single sideband is less expensive than a.m. — a lot less expensive, if you are thinking in terms of anything but a couple of watts. And, although we can't put a dollar value on it, what it saves in QRM in crowded bands is undoubtedly the most important economy of all. — *G. G.*

• *Technical Correspondence* —

HIGH-IMPEDANCE FOLDED DIPOLES

Scarsdale Manor
South Scarsdale, N. Y.

Technical Editor, *QST*:

Professor John Kraus in his book, "Antennas," on page 418 shows that there is a substantial advantage in using the series-type folded dipole (illustrated on page 101 in my edition of the ARRL *Antenna Book*) rather than using the parallel-type folded dipole if a high input impedance is required. In particular, he gives the impedance of the 3-wire series type as approximately 900 ohms as compared to the more usual figure of 630 ohms for the 3-wire parallel type. This is important when one desires to use an 8JK beam, for example, without using a matching section.

— *Francis Enge, W2HSZ*

[Beams have been described from time to time using 2-wire folded-dipole elements, but W2HSZ is pointing out a factor that well may have been overlooked. By using 3-wire series-folded dipoles, it might be possible to maintain the input impedance of an 8JK, or "flat-top beam," antenna high enough to simplify considerably the feeding and matching problem. — Ed.]

(*Continued on page 114*)

Happenings of the Month

LICENSE FEES PROPOSED

In late January FCC released a notice of proposed rule-making to establish a schedule of fees to be charged for various licensing and inspection activities. This action, as discussed in last month's editorial, results from the policy of the administration in Washington to recover, insofar as practicable, the costs of licensing (and similar) activities provided by the Government for private parties.

The proposed fees range from $3 (for amateurs, RACES, Disaster Service, and commercial operators) to $325 (for broadcast stations), although there are charges as high as $1500 for complex services such as type-approval of brand-name equipment.

Excerpts from the rule-making notice appear at the end of this item, excluding routine portions and those relating to other services. It will be noted that the comment deadline is April 1st. The Executive Committee of the League is scheduled to meet in March to formulate an official ARRL viewpoint, and meantime is in the process of assimilating background information.

In setting up its proposed system the Commission has calculated separate fees for each of its main bureaus concerned with licensing activities. The amateur division falls under the Safety & Special Radio Services Bureau, which includes also such services as marine, disaster, police, RACES, fire, and aviation. It is proposed that a fee of $10 be levied for each application in the jurisdiction of this bureau, *except* for amateurs, disaster, RACES, and commercial operators, where the proposed fee is $3. In the amateur case the fee is required with any application whether it be for station license, operator license, renewal, modification, *or any combination thereof*. In other words, a normal application for a new ticket, station and operator privileges, would require only a single fee. Applications for a higher grade of license, or a change of address, considered "modifications" by FCC, would require a single fee; if in such a case the license was due for renewal and the renewal application could be combined, again only the single fee would be required. Each *separate* application would require the fee.

Fees would not be acceptable by traveling FCC engineers, as payment would be made only at a district office or Washington itself. Amateurs applying to Washington for renewal or a change-of-address modification would send check or money order (or cash, at their own risk) with the application. Amateurs appearing at a district office to take examination for a higher grade of license, or persons newly applying for licenses, would pay the fee at the office; assumedly, an application for both Novice and Technician privileges would require only a single fee. Applicants intending to appear at cities visited by traveling engineers would have to send in applications, with the fee, beforehand. Those wishing to take an examination by mail would have to send their fees along with applications to the district office before receiving examination papers. No refunds of fees would be made.

Pertinent portions of the notice follow:

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington 25, D. C.

In the Matter of	
Establishment of fees for the Commission's licensing and similar activities	DOCKET NO. 10869

NOTICE OF PROPOSED RULE MAKING

1. Notice is hereby given of rule making in the above entitled matter.

2. Pursuant to the provisions of the Independent Offices Appropriation Act of 1952 (5U.S.C., Sec. 140), set out in Appendix A hereto, Congress has stated that work performed by Government agencies in connection with the issuance of franchises, licenses, permits, certificates, registrations and the like for any person, except those engaged in the transaction of official business of the Government should to the full extent possible, be self-sustaining. In order to bring about the accomplishment of this objective, Section 140 of Title 5 authorizes the head of each agency to prescribe by regulation such fees and charges as he shall determine to be fair and equitable "taking into consideration direct and indirect costs to the Government, value to the recipient, public policy or interest served, and other pertinent facts." . . .

4. The attached proposed schedule of fees for the various Commission licensing activities has been drafted in compliance with the provisions of the Budget Bureau Circular. In order that interested parties may be advised as to the basis upon which the proposed schedule of fees has been prepared, the following information is provided:

(a) The Commission has determined that all of its activities including the issuance, renewal, modification, transfer, or termination of any license or certificate must be characterized as licensing activities for which appropriate fees shall be charged with the exception of the enforcement activities of the Field Engineering and Monitoring Bureau and, to a limited extent, in the Broadcast and Safety & Special Radio Services Bureaus as well, and with the exception of the non-certification common carrier regulatory activities performed by the Common Carrier Bureau. And, in accordance with the policy of both the Congress and the over-all government program, the Commission's licensing activities for which reimbursement charges are to be levied include both the direct and indirect costs of such activities. It has been determined that during the Fiscal Year 1953 approximately 45% of the Commission's entire expenditures were in fact directly or indirectly related to licensing activities. This percentage of the Commission's budget has been utilized as the full cost recovery base from which the fees set forth in the attached schedule have been derived.

(b) In determining the proper groups or categories of licensing fees the Commission has made use of the primary functional divisions into which the Commission has been organized and has calculated separate fees for the licensing activities of each of the 4 functional bureaus as well as for the special licensing activities in the Office of the Chief

Engineer. By such a segregation it has been possible to avoid any subsidization of one type of licensing activity by another. At the same time, where personnel of one of the Commission's bureaus have performed services which are related to the licensing functions for which another bureau bears primary responsibility, the expenditures for such activities have, for purposes of the attached schedule, been allocated to the licensing functions of the latter bureau. Thus, the antenna survey and initial inspection activities of the Field Engineering and Monitoring Bureau, which are directly related to the licensing of broadcast stations, have been included in calculating the expenses of processing broadcast applications. Similarly, the expenses of such separate offices of the Commission, as the Office of Opinions and Review and Office of Hearing Examiners, have been allocated among the various functional bureaus at a ratio approximating our budget estimates as to the relative amount of time spent by such offices on the several types of licensing activities.

(c) Within each bureau the Commission has endeavored to avoid any undue multiplicity of separate charges. It has done this both upon the belief that such general grouping of related and similar licensing activities will aid both the Commission and the affected parties in complying with the new provisions with a minimum amount of additional time and effort and because of our recognition that no accurate allocation of exact costs between the various sub-categories of the Commission's licensing activities is possible. Accordingly, and in conformity with the provisions of the Budget Bureau's Circular, fees for different services within each particular bureau have been limited to a few broad comparable classes of actions.

(d) In the attached schedule no direct fees are proposed with respect to the institution of rule making proceedings, the cost of such proceedings has been considered as a portion of the normal costs of license processing in the areas covered by such rules. Moreover, no fees are proposed to be charged with respect to revocations or modifications of station licenses or suspension of operators' licenses initiated by the Commission. Finally, it is proposed to exempt from the category of applications for which a fee will be charged for processing, applications having as their sole objective the modification of existing licenses to conform with the requirements of the EARC program. This latter exception was made because the Commission believes it would manifestly not be in the public interest to penalize persons who voluntarily cooperate with the Commission in carrying out the EARC program, or similar programs, when no fees would be assessed against those persons who refuse such voluntary cooperation and are required to modify their licenses on the basis of action initiated by the Commission itself.

(e) With the exceptions indicated in the paragraph above it is proposed to charge a fee in connection with all licensing activities of the Commission. In all cases the fees have been calculated upon the basis of recovering approximately the full costs involved in carrying out the particular licensing activity in question. . . .

6. Proposed Schedule of Fees for Safety and Special Radio Services — It is proposed that a fee of ten dollars ($10) be charged for the processing of all types of applications in these services including original applications, renewals, modifications, etc., with the exception of applications in the Amateur, Disaster, and RACES services, for which a charge of three dollars ($3) will be assessed. The three dollar charge with respect to the amateur service is for *each* application filed whether for station license, operator license, change of address, renewal, etc., or any combination thereof. The lesser fee for the processing of applications in the Amateur, Disaster, and RACES services is because the Commission believes that it would be contrary to the public interest, to require applicants therefor to pay the full amount that would be required if applications in such services were grouped for purposes of this notice, with the other services coming within the jurisdiction of the Safety and Special Radio Services Bureau. . . .

12. It is contemplated that this schedule be reviewed biennially, and adjustments made where necessary to conform the fees charged to actual experience in the light of new or changed circumstances.

13. Each application for which a fee is prescribed must be accompanied by a remittance in the full amount of the fee. In no case will an application be accepted for filing or processed prior to payment of the full amount specified. Applications for which no remittance is received, or for which an insufficient amount is received, may be returned to the applicant.

14. Provision will be made for a Cashier's Office to be located in the Commission's Offices in Washington, D. C., for the purpose of accepting application fees presented in person or submitted through the mail. Applications received in Washington will be processed through the cashier's office and stamped with the amount received prior to being forwarded to the appropriate bureau or staff office for further handling. Such payments may be made in United States legal tender, Domestic or International Postal Money Orders, or checks payable to the Federal Communications Commission. All fees collected will be paid into the United States Treasury as miscellaneous receipts in accordance with the provisions of Section 140 of Title 5 of the U. S. Code.

15. For the convenience of applicants presenting applications at field offices in person or by mail, arrangements will also be made for the acceptance of money orders and checks at such field offices, and in payment for such types of applications, as provided for in the Commission's Rules.

16. Receipts will not be issued for payments sent through the mails. The money order procedure provides a receipt and cancelled checks constitute a receipt for payments made in this manner. Receipts will be furnished upon request only in the case of payments made in person. The sending of cash through the mails is done entirely at the risk of the sender.

17. No refunds of fees will be made except in the case of payments in excess of the fee prescribed in the Commission's Rules.

18. No radio operator examinations will be given prior to filing of an application and payment of the proper fee at an appropriate Commission office. Such applications and fees will only be accepted at District and Sub-District offices. They will not be accepted at quarterly, semi-annual or annual examination points in cities other than those in which District and Sub-District offices are located. . . .

20. Any interested party who is of the opinion that the proposed amendments should not be adopted in the form set forth herein and any person desiring to support this proposal may file with the Commission on or before April 1, 1954, a written statement or brief setting forth his comments; replies to such comments may be filed within 10 days from the last date for filing original comments. The Commission will consider all comments and briefs presented before taking final action in this matter.

21. In accordance with the provisions of Section 1.764 of the Commission's rules, an original and 14 copies of all statements, briefs, or comments filed shall be furnished the Commission.

FEDERAL COMMUNICATIONS COMMISSION
Wm. P. Massing
Acting Secretary

Released: January 28, 1954

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

ex-GS, Maj. Edwin H. Armstrong, New York, N. Y.
W1CGX, Raymond L. Adams, Brattleboro, Vt.
W1DLH, Joseph R. Gould, West Mystic, Conn.
W1RV, Russell B. Sturgis, Barnstable, Mass.
W1UEW, Gerard J. Labarge, sr., Allston, Mass.
W2CUI, Henry C. Holman, New Brunswick, N. J.
ex-2FS, Howard L. Stanley, Caldwell, N. J.
W3FT, Meyer Grossman, Baltimore, Md.
W3KQB, Harold L. Loomis, Erie, Penna.
W5AXF, Wayne E. Sansbury, Norman, Okla.
W5FTZ, Clayton R. Leslie, Terrell, Texas
W7LCW, George W. Knox, Libby, Mont.
WN8OLS, Charles W. Wilfong, Jane Lew, W. Va.
W9DIC, Dr. Albert S. Eisenstein, Columbia, Mo.
W9NJQ, Rae F. Streeter, Brookings, S. Dak.
VO2K, Edgar H. Hopkins, Carbonear, Nfld.

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

S.S.B.

816 Kathryne Ave.
San Mateo, Calif.

Editor, *QST*:

Have just finished Grammer's article in January *QST* on s.s.b. *vs.* a.m. Now at least you have provided a ready answer to the radical fringe of a.m. die-hards that ARRL is "trying to jam s.s.b. down our throats."

However, please let us emphasize that, 9 db. or not 9 db., that is NOT the question. The car does not respond to "peak" power, but rather to a loud or soft signal, and even though Grammer mentions this at the end of the article, I doubt that the point was sufficiently stressed: Namely, that s.s.b. *gets through better* than a.m., even when the darn rig isn't putting out that last watt of "peak" power.

— *Red Blanchard, W6QYR/UYG*

406 S. Maple St.
Graham, N. C.

Editor, *QST*:

After listening to the comments on the low end of the 75-meter 'phone band it is apparent that much ill feeling exists among the operators of a.m. stations relative to s.s.b. activity. Since I probably started the movement of s.s.b. operation to the low end of that band I feel qualified to discuss the pros and cons.

First, let's face the fact that the a.m. boys have sizable investments in their equipment and have a legitimate right to object to the argument that they should change to s.s.b. Also, let us recognize the fact that there are good and bad operating techniques for any mode of transmission, be it a.m., f.m., s.s.b. or c.w. An operator who believes a "lid" is anyone who employs a system other than the one he uses automatically establishes himself as the biggest lid of all. Malicious interference caused by some a.m. operators shifting their carriers rapidly back and forth across s.s.b. stations is not only illegal but rather useless since it rarely causes serious interference. Further, if any s.s.b. operators deliberately cause interference to a.m. stations they place themselves in the same "nitwit" category. A plague on both their houses.

We come then, to the big question — what's to be done? First, let it be known that this problem does not vitally concern me. My prime interest on all bands is DX and 80 per cent of my operations are with stations outside the American 'phone bands. Also, since I operate a.m., s.s.b. and c.w. I believe I can be reasonably objective.

The only intelligent comment on the matter I've heard came from W1BCR. He objected, and rightly so, to being told that he'd better change to s.s.b. (I hope he doesn't since he already covers me in Europe on 75.) He suggested setting aside certain frequencies for s.s.b. operation. That may be a possible solution provided a.m. operation was forbidden on those frequencies. In any case, BCR had some ideas on the matter. Certainly some such move would help — it certainly would help lower the blood pressure of one W2 whose nightly antics cause me concern for both his mental and physical well-being. Some night I'm certain he'll keel over with apoplexy. I must confess, however, that my grief will be shallow and my period of bereavement of short duration, possibly as short as two hours. I'll miss him though — his vindictiveness is monumental.

To be candid I don't know that I have a solution, but I'm sure there must be one. I'm also certain that no amicable arrangements are possible in the heat of anger. I do, however, have five suggestions: First, simmer down. Second, where a.m. stations encounter interference from s.s.b. stations the receiver should be used intelligently — turn the a.v.c. off, and lower the r.f. gain setting. The buckshot you hear, in 99 per cent of the cases, is simply a case of receiver overloading. Three, stop the foolish operating practices which serve no useful purpose and are a mark of ignorance. Fourth, give the whole matter some serious and intelligent thought. Get in QSO with the lads who use a transmission method other than your own. Voice your opinions but avoid bitterness. I personally have never failed to QSY when told, or otherwise was aware, that I was interfering with a QSO already in progress. Lastly, consider whether or not we are in a period of slow transition from a.m. to s.s.b. It happened before when c.w. replaced spark. On the other hand possibly s.s.b. will be abandoned by the hams but this is rather doubtful.

Looks as though we'll just have to behave like gentlemen for a while until the trend is established.

— *Bob Moren, W4INL*

STOLEN GEAR LOCATED

3108 Wenz Ave.
Waco, Texas

Editor, *QST*:

This is to notify you that the transmitter and receiver that were stolen from this club have been located through the article in January *QST*. We want to thank you for putting the article in the magazine and helping us locate the equipment.

A ham stationed at an Air Force base in Texas confessed to breaking into the civil defense building and stealing the transmitter and receiver, then later selling it to W5CVQ, to whom he told a hard-luck story about his XYL having polio and he needed the money to put her in the hospital. But he let it slip that his car was bought from a Waco used car lot and W5CVQ remembered the name of the car lot, where we got a lead on him. He had given W5CVQ a fictitious name. After W5CVQ read the article in *QST* he knew that he had our stolen equipment and called me by telephone to get the serial numbers which I had got just a few days ago. They were the same numbers.

I think every club should be warned to record the serial numbers of their equipment so that they would be available if needed.

— *C. J. McCauley, W5TVA*

NOVICES TAKE HEED!

444 W. Valencia Ave.
Burbank, Calif.

Editor, *QST*:

I would like to offer the Novices some advice which I think that after 46 years of operating I am qualified to do.

I feel a responsibility to Novices and get a great deal of pleasure from making contacts with them and I am often their first W6. They all want QSL cards which I am always glad to send along. Many of them, say from the Middle West, whose 75-watt sigs are naturally very weak, will start out by giving the weather, their rig, how old they are, etc. By the time this is completed, and if the Novice is new on the air, he makes a lot of mistakes and goes very slow. He generally begins to fade out. He's gone with the wind. His call is not yet in the *Call Book*. All I can do is sit there wondering what the street address and town is of Johnny Novice "somewhere" in the Middle West. Naturally he doesn't get the QSL card, and I'm his first coveted W6.

Here's what Johnny should do on his first comeback: "W6IAH de WN0 — ur sigs RST 569 hr in Kansas City. QTH 333 N Ham Street." Now if Johnny starts to fade out (QSB) I already have all the dope and it doesn't matter. He gets his first W6 QSL card and feels happy about it.

— *Stanley E. Hyde, W6IAH*

WAT SA?

1810 Spear Street
Logansport, Indiana

Editor, *QST*:

When a stranger learns I operate an amateur station, the first question he asks is, "How far can you talk?" Invariably this is followed by, "What do you talk about?" A thumping he takes care of the first question, but answering the second has always bothered me. To learn what hams really DO talk about, I made a survey. . . . The following is the list of subjects noted in exactly the order in which they were heard from June 15 to September 15 of 1953: A sixty-foot tower, no time to operate, automobiles, s.s.b., TV service, weather, taking care of yard, a mutual friend, ham receivers, new house, advantages of unlisted telephone, Kinsey's book on the female, long-winded messages, a fight at a dance, fishing, crowded band conditions, building a 'phone patch, TVI, attending a circus, self-supporting tower, hot weather, playing pool, fishing for pike, the German language, low-pass filters, inboard boats, eyesight of a sparrow, fly-swatters, heavy traffic, ex-YL's opinion of hamfests, how to use field-strength meter, circus acts, robbing the baby's bank, recording equipment, southern accents, low-pass filters, gas station business, TV boosters, life in Arabia, line noise, moonshine stills, cashing checks in a strange town, going to dentist, how to cold-shoulder visitors who invite themselves to see your TV, hamfest prizes, county fair chlorophyll, trip to Florida, life in a trailer, six-year-old's first impression of school.

I was rather surprised to note that only 26% of the QSOs were related to amateur activities. Some other interesting deductions can be drawn from a study of the list.

As for me, I intend to have it mimeographed and hand a copy to anyone who asks me again, "What do hams talk about?"

— *John T. Frye, W9EGV*

MODEST, IS IT?

111 Fifth St.
Garden City, N. Y.

Editor, *QST*:

I was much impressed with the logic in the letter of our fellow amateur W6PTQ/4 in November *QST* and am in thorough agreement with his description of 1 kw. as "modest" and "moderate" power. The error in limiting amateurs to this modest power was made many years ago, and it would be difficult now to change the rules so that those who want "consistent DX talks, day after day" could have the 5 kw. that is entirely necessary.

There is, in fact, altogether too much QRM created by these little 40- and 100-watt fellows trying to break through the heavy artillery, and they might as well learn their place. It is ridiculous for a 1-kw. job to be jammed by a little fellow with better ears, better manners, better technique and it ought not be allowed.

Compared to my 40 watts at K2BH and 100 watts at W1QGU, 1 kw. doesn't seem so modest! But I am happy with both rigs.

— *Keith Henney, K2BH*

APPRAISAL

1 Ashland St.
Portsmouth, N. H.

Editor, *QST*:

Amateur radio should be kept always 100 per cent amateur. It has been the free unbonded spirit of amateur radio which has made it, through all the years, the wonderful source of pleasure and enjoyment and fraternal brotherhood that so many of us have enjoyed and loved for many years now.

It has been this unchanging spirit and devotion which has made it great and unique. Changes in our equipment have been many of course but the spirit of ham radio seeded by T.O.M. himself has been the shining glory that has made this fraternal brotherhood great. T.O.M. put into words, usually in a humorous vein, the thing which we all felt in our hearts the permeating spirit of amateur radio. It has lived on these many years after his passing. If amateur radio is to continue to be the truly great thing that it has been, this spirit must never be allowed to fade. In this respect we should never, "Go modern."

In the past few years, many thousands of new amateurs, or as T.O.M. would say, "young squirts," have joined our ranks. Very few of these people have ever heard of T.O.M. or the glorious traditions of amateur radio. This may seem unbelievable to the old-timer, who has lived it so many years but nevertheless it is a true fact. Proof of this deplorable state of affairs can be had at almost any radio club. Just ask any member who has joined our ranks in the last five or even ten years. Ask them about T.O.M., Final Authority, the Wouff Hong, the Rettysnitch, Old Betsy, the Young Squirts, Rotten Radio and Kitty, and be amazed at the blank expression on their faces.

Yet, it is the stories of these things that has made and preserved amateur radio and made it different from other hobbies, such as stamp collecting, photography, and so many others. It is these things that has put the true spirit into our beloved hobby and made it really live.

Should we allow our hobby to degenerate into merely an electrical and mechanical plaything, however technically perfect it may become, we shall have lost forever the spirit which has made it so dear and close to the hearts of so many of us. The old traditions of amateur radio must be kept alive.

Throughout the years, we have lent the facilities of our hobby to other agencies, such as the Red Cross, police and fire depts., civil defense, etc. This is as it should be; however, we must be extremely careful that these things do not become the controlling factor in our amateur radio affairs. Should these things control us, we will have lost our hobby, as such, forever.

It has been alarming to note that many amateur radio clubs have in the past several years lost their identity as an amateur radio club and have become merely units of other agencies. This is a danger sign which we cannot afford to ignore. We must keep amateur radio purely and simply amateur, assisting other agencies, of course, but our first interest must be ourselves. We must be jealous and selfish in this respect. We must never become a regimented group of radio operators only.

—*John W. Singleton, W1CDX*

Strays

Last fall, Senator Wiley, of Wisconsin, had correspondence with Chairman Hyde, of FCC, expressing concern over the possible use of radio equipment by subversives and the possible desirability of establishing security checks for all classes of radio operators. Amateur operators were included but a statement from the Senator's office made it plain he had a complete understanding and appreciation of the value of our services to our country. However, the original statement was not always accurately reported in the press and some columnists, in particular, had some pretty lurid versions.

Recently, a ham editorial (not in *QST*) wrote about Senator Wiley's concern in somewhat alarmist fashion, apparently not having completely evaluated the press statements which the Senator did release. As a result, the Senator has been obliged to issue a lengthy statement to make it plain again that he is fully aware of our background, and he includes numerous laudatory statements calculated, we are sure, to make certain he is not again misquoted nor misunderstood as regards amateurs and amateur radio.

For our part, we repeat what we stated to the press at the time, on the subject of security checks for radio operators: We had just such checks immediately prior to World War II (including fingerprinting) and we don't believe any amateur would hesitate to comply again, should such procedures again be required.

Hints and Kinks For the Experimenter

MORE ABOUT GENERATOR NOISE

Worn and otherwise defective generator bearings have been identified as a source of electrical interference. In a mobile installation here, the receiver was bothered by a raspy type of noise that sounded similar to power-line leakage. It was present on all bands and, at times, seemed to build up and discharge with a sawtooth characteristic. Breaking the field and the armature connections to the generator did not appear to affect the intensity of the noise. However, the replacement of a worn bearing did completely eliminate the interference. A probable explanation is that the generation of static electricity was greatly reduced by the repair.

— *Joseph E. Stuckey, W4HCV*

MOUNTING AND TAPPING B & W MINIDUCTORS

Nearly all users of B & W Miniductors mount these small ready-wound coils out in the open without regard to mechanical protection. In cases where the latter is desirable, it is suggested that the inductors be slipped inside of regular coil forms. The Amphenol types 24-4P, -5P and -6P will accommodate the 1-inch diameter coils and several manufacturers make forms that will enclose the ½- through ¾-inch diameter units. In most cases, it is necessary to round off the outside surfaces of the coil support bars (use fine sandpaper) before the Miniductor can be slipped into the form.

Another method of mounting Miniductor is shown in Fig. 1. The protective covering for the coil is a transparent case used originally by a manufacturer (Walsco) as a container for hardware and small radio parts. This method of support is especially effective and convenient because it permits chassis or panel mounting, provides good mechanical protection and prevents the accumulation of dust around the turns, support bars, etc.

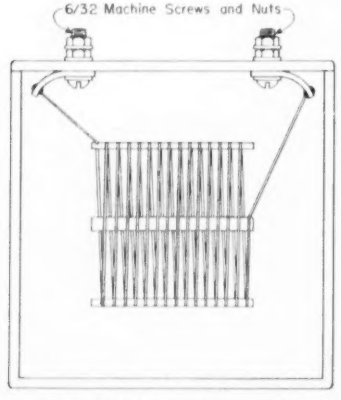


Fig. 1 — B & W Miniductor mounted in a transparent parts container.

Taps easily can be soldered to Miniductor by using small wire — No. 36 does very well — and a sliver of mica. Fig. 2 shows how the mica can be used to protect the winding during the soldering operation and to prevent shorts between the tapped and adjacent turns. — *CP1BK*

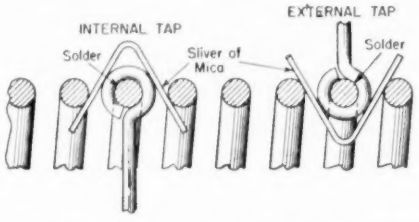


Fig. 2 — CP1BK suggests the use of small wire and a mica sliver when soldering taps to B & W Miniductor.

SUPPRESSION OF AUTO-GAUGE INTERFERENCE

Mobile fans may be interested in my recent experiments with noise suppression in late model ('49–'52) Ford vehicles owned by the Texas Gas Transmission Corp., of which I am communications foreman.

After reducing ignition and regulator noise to a tolerable level, the remaining interference was quite severe. With the help of a coaxial feed line tied to the antenna terminals of a 50-Mc. receiver, it was determined that most of this noise was coming from the electrical oil-pressure gauge (motor block unit). The electrical temperature and gas gauges were also identified as sources of noise. Interference created by these three instruments was reduced by the installation of 0.01-μf. disk ceramic capacitors between the gauge terminals and ground. Lead length of the disks should be made as short as possible and soldering at the grounded ends is recommended.

After the work on the company vehicles had been completed, the above noise suppression method was tried out on the writer's personal car which carries a 4-Mc. mobile installation. Results obtained were most gratifying. W4MGT also reports favorably on the oil-gauge by-passing stunt. — *Robert A. Thomason, W4SUD*

Strays

Especially a shock to radio amateurs was the sudden passing of Major Edwin H. Armstrong, ex-GS, long famed as a prolific contributor to the radio science. His participation in the epochal 1921 Transatlantic Tests as a member of the 1BCG operating team is one of the highlights of ham history — his signature is among those on the historic first transatlantic amateur radio message as transmitted to Paul Godley in Scotland. Veterans of the art also will recall an early article on application of the principle of heterodyning, "A New Method for the Reception of Weak Signals at Short Wavelengths," authored by Maj. Armstrong in February, 1920, *QST*. This marked the introduction of the superheterodyne to the amateur field.

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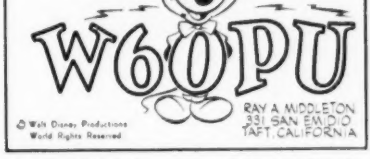
W6OPU was surprised quite recently to find his call sign appearing in a *Mickey Mouse* comic strip episode. Curious as to what prompted Disney Productions to select *his* call, Ray dropped them a line. He found that it had been picked



This W6OPU QSL confirmed QSO with W1AW.

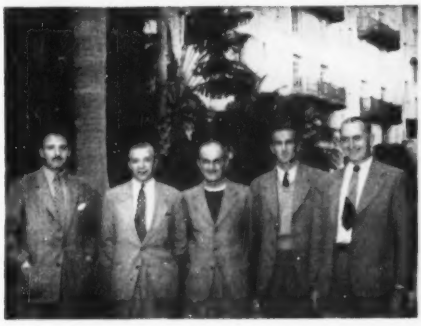
quite at random. The studios later made him a present of a set of "Mickey Mouse QSLs," one of which is reproduced above. (No, the rest of us needn't write the company for QSLs — they're *not* in the business!)

—···—

An active licensed amateur for more than 30 years, Roy D. Jordan, W2KUD, recently was named manager of advertising and sales promotion for General Electric.

♦

ARRL Communications Manager and Vice-President F. E. Handy, W1BDI (right), congratulates Bob White, W1WPO, Assistant Communications Manager, C.W., on the accomplishment of a "WN" WAS. Bob turned the trick in less than five months, working 259 Novices between Sept. 1, 1953, and Jan. 11, 1954 — 78 on 3.5 Mc., 167 on 7 Mc., 12 on 21 Mc. and 2 on 144 Mc. Nevada was the "holdout" until WN7TGK's QSL popped through. Just above the WAS certificate you'll notice a Minnesota QSL from WN0BT, one of those rare two-letter Novices (p. 10, Jan. *QST*). W1WPO, primarily interested in DX, runs 40 100 watts to a Collins rig, has a Vee beam and uses an NC-200 receiver.



When the "Big Three" Conference convened at Bermuda last December — President Eisenhower, Prime Minister Churchill and Premier Laniel attending — amateur radio was well represented among the scores of engineers and correspondents who covered the affair. Engineers W3TM (CBS), W3ER (Fox-Movietone), ex-2AFW (CBS), VP9XX (stations ZBM1 and ZBM2) and W3ANJ (NBC), shown above from left to right, found time to get together for an informal hamchat on the Garden Terrace of Bermuda's Castle Harbour Hotel, press and communications headquarters for the event.

—···—

Speed is the trend of the day. WN9AEM received a QSL postmarked December 18th confirming QSO with a WN1 on December 19th.

—···—

Last Hallowe'en one of W9QVH's neighbors was disturbed by the mad convulsing of his radio-controlled garage door. Our youth becomes more electronics-minded year by year.

—···—

Several long nights of ambitious CQing brought no QSOs for newly licensed WN8ODO. At long last he did get out, though, and literally. He finally raised WN8*OUT*.

—···—

W2TID, first licensed as W8BWF in 1932, manages to get on the air almost daily at the tender age of 83. He wonders how many other "83ers" are as radio-active as he. By the way, the name is Young.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Fifth Annual YL-OM Contest

CONTEST PERIOD

Starts: Saturday, March 6th, 1954, at 1:00 P.M. EST.

Ends: Sunday, March 7th, 1954, at 12:00 Midnight EST.

Here's fair warning and an invitation to all OMs. Come March 6th and 7th you'll hear more YLs on the air at one time than you've heard since the *last* YL-OM Contest. And best of all, the girls will be looking for YOU — for YOUR contact. Don't overlook the possible bonus of

WAS/YL and YLCC, too. If you want to be popular and have a good time, just call "CQ YL," on the important dates and enjoy being pleasantly rushed. The rules follow.

Page No. ___

Station Call _____ Operator _____ Power Input: ____

QTH _____ 'Phone ____ CW ____

Date Time	Freq.	Sent		Received			Multiplier
		No.	RPT	STATION WORKED	No.	RPT	STATE OR COUNTRY	

Suggested log form for YL-OM Contest. For cross-band operation, an additional column should list the frequency of each station worked.

Eligibility: All licensed OMs and all licensed YLs and XYLs are eligible.

Frequencies: All bands may be used. Cross-band operation is permitted.

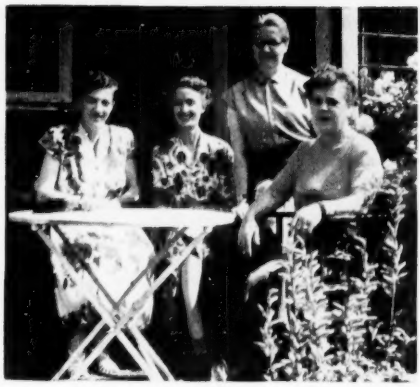
Procedure: Call "CQ YL" or "CQ OM."

Exchange: QSO number, RS or RST report and state, U. S. Possession, VE district or country, should be exchanged.

Scoring: (a) One point is earned for each station worked (YL-to-OM *or* OM-to-YL *only*). (b) Stations and multipliers count only once, regardless of band or mode of operation. (c) Add number of points and multiply by number of different states, U. S. Possessions, VE districts and countries worked. (d) All 'phone contestants running 150 watts input or less *at all times* then may multiply final score by 1.5. (e) All c.w. contestants running 150 watts input or less *at all times* then may multiply final score by 1.25. (f) Maryland and District of Columbia count as one state.

Awards: Highest OM score and highest YL score, regardless of mode of operation — cup and certificate. Highest OM 'phone-to-'phone score and highest YL 'phone-to-'phone score — cup and certificate. Highest OM c.w.-to-c.w. score and highest YL c.w.-to-c.w. score — cup and certificate. Second and third highest in each category will receive certificates. Winner of one award is not eligible for others. The cups are awarded on a yearly basis with a three-time winner obtaining permanent possession.

Logs: Copies of contestants' logs must be postmarked not later than March 27th, 1954, and must be sent directly to Ruth B. Siegelman, W2OWL, Vice-President, YLRL, 1414 Wythe Place, Bronx 52, New York. All contestants must fill in their own logs while operating — no help is permitted. Contestants are requested to send in separate 'phone-to-'phone, c.w.-to-c.w., 'phone-to-c.w., and c.w.-to-'phone logs. State power input. Please send in copies of logs, regardless of size of score, to help in cross-checking other logs



When Liz Zandonini, W3CDQ, toured Europe last summer, she received a warm welcome from several of England's YLs. The above photo was taken at the home of G2YL, Nell, by W4HWR, Hilda, well-known YL from the States, who has been living in England with her OM, W4EFG, for the past two years. In the photo, from left to right, are G2YL, G3ACC, G8YL and W3CDQ. G3ACC, Meg, is on 20, 40 and 80; G2YL, Nell and G8YL, Constance, are on 2. Liz also visited ON4s LP, MG, PJ and HER.

YL Net Changes and Additions

YLRL Vice-President W2OWL reports a new 40-meter 'phone net Thursday at 10:00 A.M. EST on 7215 kc.; W4SGD is NCS.

The 75-meter 'phone net which formerly met Wednesday at 8:00 A.M. EST — 3900 kc. — has been changed to Tuesday, same time, same frequency. W8HLF continues as NCS.

The Wednesday 75-meter 'phone net under NCS W1VOS has been changed from 7:00 A.M. to 7:30 A.M. EST. The frequency remains 3900 kc.

W6UHA replaces W6EHA as NCS of the 20-

(*Continued on page 116*)

* YL Editor, *QST*. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

The other day somebody asked Jeeves how our old friend Sunspot Sam McSquegg was doing. We've been a little out of touch with Sam but it brings to mind an episode of some years back, an incident very typical of the fellow. It came about when an old crony visited the McSquegg ham shack, a buddy he hadn't seen for years. It was that old China hand (and ham) Tommy Hawke, just returned from Peking, and Tom was indeed a DX man of the old school.

Conditions had been a little spotty on 14 Mc., so Sunspot Sam rigged up some nonsense to impress pal Tommy. He contacted his neighborhood sidekick, Grommethead Schultz, and cooked up a nice DX QSO the easy way. It was arranged for Grommethead to modulate the output of a BC-221 freqmeter and show up on 14,199 kc. signing the call AC5AC. The conniving pair went to considerable length to get the signal level just right, the QSB just right (Grommethead's gripping and ungripping his antenna feeders did the job perfectly) and the AC5 speech accent just right. At the latter detail Schultz's best efforts weren't too gratifying until his normal speaking voice was found to be ideal for the purpose.

Peking Tom dropped in on schedule. After he and host McSquegg had dispatched a few hot toddies and mutual old acquaintances, the two fired up the rig. Sunspot glanced slyly at the clock and called a short three-by-three "CQ DX" on 14,202. (He could have called "CQ Asia" but didn't want to overdo the thing, you see.)

Back, of course, came a weak and wavery carrier with garbled modulation calling Sunspot McSquegg. Both Sunspot and Tom had trouble making out the call; they settled for AC5AC. And Grommethead was really laying it on thick — *what* an accent!

Peking was extremely impressed. His jaw dropped even farther as McSquegg calmly wound up the QSO in brusk businesslike fashion: "You needn't bother to QSL, old chap. I collect cards from only the rarer stations I work. Now I'll say seventy-three and tune the band for something juicy."

Just about then the telephone rang. Sunspot excused himself and answered it. Grommethead.

"Sorry I couldn't make the sked tonight, Sunspot," apologized Schultzie. "Got tied up at the office. By the way, Eddie Currance called me up around an hour ago and told me there's a *legit* AC5 coming through on twenty. Real coincidental, ain't it? Maybe you can raise *him* for Peking Tom, hi hi. Seventy-three and CUL."

The Bhutan gang must have a very efficient grapevine — Sunspot McSquegg hasn't had another nibble from an AC5 to this very day. His pleading letters to AC5JZ go unanswered and his gifts are returned unopened.

What:

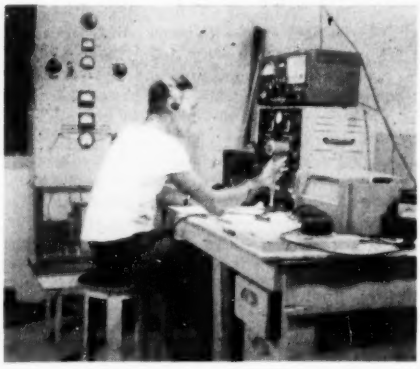
There's no doubt about it — *one-sixty* will have to start things off this month. During the first part of the year DX has been showing up on Top Band in considerable force. Not only have we had fun with transatlantics, but transpacifics as well. **VR2**BJ (1885) gladdened the hearts of W**0**s APF FIM IFH and W3RGQ one morn around chow time — real DX on any band . . . . . Catches on 160 hither and yon are reported as follows. *W9PNE*: **CN2**AO, **G**s 3PU 5JU 5RI 6GM; **KV4**AA, **VP7**NM. *W1BB*: CN2AO, **GW**3ZV, **HB9**s CM T and numerous Gs. *W3RGQ*: CN2AO, **EI**9J, GW3ZV, HB9CM, **KV4**BB, VP7NM and eighteen Gs. *W2QHH*: CN2AO, EI9J, **GC**2CNC, VP7NM, **VP9**BK. *KZ5DE*: W2EQS, W2QHH, G3PU. *W8ANO*: CN2AO, **G**s 3BKF 3PU 5JU 6BQ, VP7NM. *K2ANR*: CN2AO, **G**s 2HX 3HRW 6CJ 6CT, GW3ZV, HB9T, VP7NM, **ZL**3RB. *W1VDB*: CN2AO, EI9J, **G**s 3ERN 3PU 5KM 5UF 6BQ 6GM . . . . . Another good bet for South America showed up in **HC**1KV (1880); W9s NH and PNE quickly picked him off . . . . . A few highlights of recent 160-meter operation: W0NWX's two 1100-foot long-wires bringing him up to 18 countries and 5 continents, including KC6 and KH6. . . . The walloping signals of GW3ZV and W4KFC on opposite sides of the pond. . . . The suspense of VS2CQ schedules with W9s NH PNE and W0NWX (no luck up to this writing). . . . The potent 4.4 watts of QRP specialist GC2CNC, who provided a new 160-meter country for many. . . . OH3NY's hearing nine Ws in one evening (OHs can no longer transmit on Top Band). . . . W1BB's potent three-skywire antenna farm and mysterious "antenna number three." . . . The 'phones of W5WEH, W7HC, W8GDQ and W0FOG being heard by VR2BJ in Fiji . . . . . **ZL**1WW's 160-meter DX QSOs for late 1953 included Ws 1BB 2MCU 2WWP 8ANO 8GDQ and 9NH; ZS3K has been hearing KV4BB on the band . . . . . Here's a rundown on DX now known to be active in the 1.8-Mc. range: CN2AO, **DL**1HX, EI9J, **G**s 2HKU 2HX 2PL 3BKF 3BMY 3ERN 3GGN 3HHV 3HRW 3HVX 3IAF/A 3JKO 3PU 5JO

* DX Editor, *QST*.

5JU 5KM 5RI 5UF 6BM 6BQ 6CJ 6CT 6GM 6LB 8JM 8JR, **GC**s 2CNC 3EML 4LI, **GD**3UB, **GI**5UR, **GM**6IZ, GW3ZV, HB9s CM T, HC1KV, **KP**4KD, KV4s AA BB, **KZ**5DE, **LU**4DM, **OK**1s, AJB KAC, **VP**s 4LZ 6EB 7NM 9BF 9BK, VR2BJ, **YI**2AM, **ZB**1BJ, **ZC**4s CA CK FB GF, **ZS**3s A K, ZLs 1WW and 3RB. That represents over two dozen countries on all continents — let's hope you included 160 meters in *your* ARRL DX Test plans for this year! . . . . . W9PNE is up to 12 countries (4 continents) and W9NH reached 14 and 5, through recent openings . . . . . Jeeves & Co. thanks W1BB, W2QHH, W3RGQ, W9NH and W9PNE for extra efforts in keeping this corner up to date on Top Band doings. The March Trans-atlantic Test date is the 14th and it will be the last scheduled run for the season. Good fishin'! . . . . . A just-under-the-deadline contrib from W3EIS reports good luck with CN2AO, EI9J, Gs 3PC 5JU 5RI 6BQ 6CJ 6GM, GW3ZV, KV4AA and VP7NM.

Now for a look at recent *twenty-meter c.w.* shenanigans. Although shoved out of the lead-off spot by upstart 160, 14 Mc. still remains the band where the elite meet to greet the rare ones. W9HUZ, for instance, chatted with this impressive group: **CR6**s AI (14,059), CS (030), CZ (043), **CT3**AB (017), **EA8**AB (078), **ET2**US (050), **FQ8**AF (042), **I5**LV (046), **KR6**AZ (078), **KW6**BB (080), LB8YB (038) of Jan Mayen, **MF**2AE (022), **OQ**s 5GU (060), 5VN (044), 0ØDZ (055), **SP**s 3AN (040), 9KA1D (012), **ST**2HK (064), **SV0**WY (093), **VK**s 1AF (120), 9YY (095), 9WZ (062), **VP8**AN (022), **VQ**s 2W (042), 3EO (034), 4DX (012), 4QQ (014), **VU**2JK (015), **YI**2AM (028), **ZB**s 1CU (019), 2I (084), **ZC4**IP (095), **ZD4**s BJ (106), BN (046), **ZK**s 1AB (035), 2AA (065), **ZS**7D (082), **4X4**s DK (076) and FQ (075) . . . . . K2GFQ, who has been W6JKH for some 20 years, caught **CR7**LU (075), **FQ8**AS (035 t7), **OD5**s AF (080), XX (085), **OQ**5CP (060), **ZE**3JP (055) and **ZS3**KG (065) with 170 watts and ground-plane . . . . . **CR5**AC (080), **CR7**IZ (014), **CT2**BO (038), **DM2**ACM (070), **HC1**JW (010), **TA**3MP (010), **TF**s 3MB (070), 5SV (041), **VQ**s 2AB (065), 4EI (045), **3V8**AN (040) and others already listed came back to W8HJK's 100 watts and 3-el. twirler . . . . . W8KIA, via W2GT, mentions the appearance of a pair of pretties — **FL8**CJ (075) and **ZD8**A (100) . . . . . W8JGU kept the ball rolling with **CR**s 7AU 9AH, **EL**s 2X 7A, **ET2**DF, **FO8**s AC AI, **FQ8**s AK AT, **JA**s 1CJ 1CR 1GD 8AQ, **KA**s 7AR 8AT, **KF3**AB, **KG6**FAA, **KR6**s AA LP, **ST2**AR, **SV0**WE, **VQ**s 1NZK 2GW 3KIF, ZB1JY, **ZD**s 2DCP 9AA, **ZE**s 4JY 5JA, ZS3T and **4X4**RE . . . . . Although **LX1**AS, LZ1KZP, **VQ6**UU and **ZS7**D got away, W2HSZ made hay with **CR7**s AN CH, **EL2**P, **ZD4**AB, **ZE**s 3JO 5JY, **ZS3**BC and several other goodies. He concurs with consensus that African openings on 20 have been the steadiest . . . . . A Viking rig and 3-el. beam helped W8HMI to 96 countries since last June. Trophies include **CR7**s AF CO, **HR1**JM, **JA**s 1CB 2AN 2CZ 3AC 5AB 8AA, **KA**s 3MD 8SC 9MF, **KG4**AN, **YV1**BK, **ZD2**HAH, **ZE2**JC, ZP5CQ and **5A1**TJ . . . . . **JA**s 1CO 3AB 5AL 8AI, **KA3**AF, **LX1**s AX JW, W3WLP/**KG6**, **VU2**EJ and **ZC4**RX enabled W3AXT to reach a 152/130 tally . . . . . Transcontinental DX Club report via W4ZAE: **AP2**W (022), **CR7**IV (097), **FQ8**AC (010-040, a.c. note), **JA7**CZ (020), **KA3**LW (050), **SV0**WG (072), **VQ**s 2DT (057), 4ET (040), 4TOT (058) and **YN1**AA (045). Others at W4ZAE include **FP8**AP (042), **OX3**AY (058) and **VK1**TD (040) on Heard Island . . . . . When the water isn't too high on the Puyallup, W7OEB mixes in a little steelhead fishing with such ham-style angling as **CR9**AF, **JA**s 2XE and 3BB . . . . . W1MLI soaked up **C9**AA (053), **FB8BE** (100), **LU4ZS** (050), **LZ1**KPZ, **MP4**BBD (046), **OD5**AD (030), **VU2**NB (040) and **ZK1**BC (070) . . . . . W1BTQ, all set to become a W3 or W4, knocked off **5A4**TG and **9S4**AL in a recent foray. Lack of New Mexico bars the way to Turk's W1 WAS . . . . . Scattered workings here and there: At *W1BIH* — **FM7**WX, **PX1**AB, **YK1**AH. *W2ZGB* — **CX4**CZ, **EA8**BF, **KX6**BC. *W9ESQ* — **PX1**AC, **TI9**UXX. *W1WTF* — most unusual KT4HFV . . . . . *No. Calif. DX Club's DXer* calls attention to the activities of **AC4**NC (120), **C3**BF, **FW8**AB, **HE9**ECS (088), **HR1**AT (053), **SU1**88 (055), **VK**s 1RL (125) on Macquarrie, 9GM of Norfolk Isle (020), **VP8**AQ (067 t7), **VS6**CR (050), **ZC**s 3AB (080) and 5VM.

On *twenty 'phone*, this same organization notes the presence of **CR6**CB (14,110), **CS3**AC (180), **ET2**US (320), F9QV/Corsica (198), **HR1**JM (180), **SV0**WH (160), **VK9**RS of Norfolk Island, **VP**s 3YG (185), 8AM (165) of the Falklands, **3V8**s AS (150) and BA (140) . . . . . W8JGU gets in some good A3 licks: **CP**5AB, **CR6**AI, **HR1**AA, **OA4**BT, **TG9**RB, **VP**s 3HAG 3YG 4LZ 5AR 7NM and **YN4**CB . . . . . A "fugitive from 75-'phone traffic nets," W2KJG put his vocal contraption on 20 for **FM7**WN, **FP8**AP, HI6EC, **HK1**HF, **HP3**DA, **ET2**PA, **KG4**AO, OQ0DZ, **OX3**BD, PJ2AF, **VP2**DL, **VQ**s 2DT 3RJB 4AC, **ZB2**A, **ZS3**E and **5A4**TJ . . . . . W9AVJ (W9GVZ) mentions **CR6**AG (171) and **HH3**DM, finding that the latter is closing shop in favor of KP4-land.



Jean Duplat, FK8AB, sends us this photo of his recently renovated Noumea shack. The rig at his left runs 50 watts to a cool 813 final. Jean's exciter is a 6L6-807 crystal-controlled arrangement and 811s do the modulating. His receivers are an S-40 and HQ-120X.

Concerning *forty 'phone*, W9AVJ points out contacts with **KG6**ABN (7245), **KJ6**AY (7215) and **KX6**BB (7215), all three shortly after breakfast time CST . . . . . W2QHH raised **HK2**AU . . . . . W1APA took care of **HH3**DL (7203), HP3FL (7190), **VP2**DL (7150), W9FZS/VO4 and **YN4**CB (7200).

Forty c.w. helps to keep the wee hours from drawing a total blank these difficult days. W8BKP was pleased to collide with Fanning Islander **VR3**D (7028) at 0530 EST . . . . . W7JLU accumulated an excellent agglomeration: **Cs** 3BF (10), 6AA (65), **DU1**DO (54), **HH2**OT (55), **HK3**CV (05), **HR1**AT (15), **JA9**AC, **LU4ZS**, **TI2**CR (15), **VK9**WZ, **VP4**LZ (10), **VR2**CG (15), some PYs and **YS1**N (25) . . . . . W2ZGB's new ground-plane captured **HK1**TH, **VP8**AX and **4X4**DK . . . . . W8JGU got that 4X4 as well as **VP7**NM and **9S4**AX (11) . . . . . **CR7**CI (32), **FA9**VN (02), **HK1**GP (16), **KX6**s BF UZ, LB8YB

♦

African photographic safaris are the business o Gaby Félix, ON4FG-OQ5FG-OQØFG, who has left his mark on such Hollywoodian epics as *African Queen* and *King Solomon's Mines*. This picture is particularly interesting because it shows Gaby running up footage at the foot of erupting Shabubembe in Belgian Congo's Kivu province — a little too close for comfort.

***QST* for**

VS2DB has many speaking acquaintances among the 20-meter 'phone crowd and is available almost daily between 1430 and 1600 GCT. The rig runs 60 watts to an 829 and the receiver is a BRT-400D. A Grundig recorder and BC-221 freqmeter are handy accessories.

(22) of Jan Mayen, **TF**3AB (24), **VP**s 2MD (10), **8**AK (10) and **ZE**3JI (35) worked W9HUZ . . . . . W**Ø**FBI wrestled with **CN8**BF (13), **HH**2LD (38), 12 VKs, 5 **ZL**s and 4 **PY**s . . . . . W9RQX reports an interesting 3-way with W5RID and Greek ship SV1SMX (47) . . . . . The 81ls at KZ5CI took a bite out of many Europeans including **SP**3AN (18) and **MF**2AG (25) . . . . . **OQ**5GU (50), **SVØWG** (10), **VQ4**s ET (10) and TOT (10) succumbed to TCDXC onslaughts, while **ZC4**IP (20) gave W2LYO a tumble . . . . . W3AXT has **HH**s 3RC 4MV and **CM**1AR bagged. Sam caught G2RO in VP1 VP2 VP6 and VP7.

Slacktivity is the keynote on *fifteen* at this writing. Nevertheless, W9HUZ uncovered **CR7**AG (21,036), **JA**1CO (121), **KG6**ADY (080), OQ5GU (060), **VQ2**AB (036) and **ZE**3JO (095) on c.w. . . . . **CP**5EK, **KH6**s AAI AVP, **KV4**BD, **KZ5**s DG LM NM, **PJ2**AP, **TI2**RC, **YV**5AP, **ZD1**SW, **ZL2**s ADM BE, **ZS**s 1MP and 5OV replied to W6ZZ on 'phone. The Sierra Leone item was Miles' 134th country, 61st on 15 meters and 53rd on 21-Me, 'phone. W6ZZ seized a lull in DX openings to pursue some research on flying-saucer phenomena.

On *eighty*, W2LYO has gathered 35 3.5-Mc. countries since last November. Conditions remain fringy but Dick scored with the following (times EST): **FA**5BG 1710, **KL7**PI 2108, **PY6**ABS 1845, **VP4**LZ 2105, **VP7**NM 1915, **YI**3AR 1745, **YU**1AD 2340 and **ZD4**AB 2015 . . . . . W1ORP overtook **EA6**AF (3507) of the Balearics, **FA**8DA (21), **SP**3AN (06), **TA**3AA (15), **ZL1**CI (15) and **9S4**AX (07). Ed hears Russians UA2KAW, UA3KF, UB5ABA, UC2KAB, UQ2AN and UQ2KAA but, of course, no comebacks . . . . . W3AXT's 80-meter report on **HH**3RC (his No. 59 on 3.5 Mc.), **SP9**KAD, **VQ4**HJP and **YN**1AA closes this month's Band Parade.

Where:

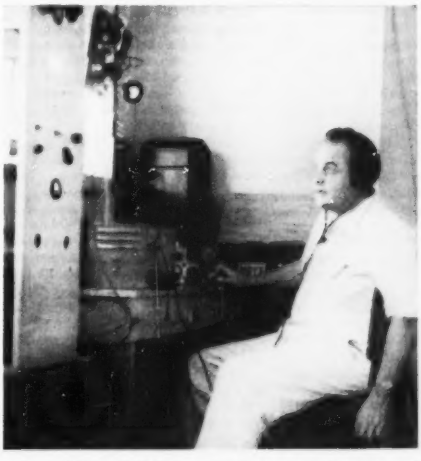
QSLs for DM2 stations (East Germany) can go via QSL Vermittlung, D.D.R., Post Box 666, Halle (Saale), Germany . . . . . W8HEV continues his commendable volunteered QSL duties on behalf of FM7WD and those of us seeking Martinique cards — check October, 1953, *QST* for details . . . . . As noted perviously in this section, QSLs for British Empire African and Caribbean stations whose calls end in "RO" may be sent via RSGB. G2RO, author of the series, did booming business in Grenada as VP2GRO, allowing dozens of the brethren to check the Windwards off their lists . . . . . As shown in the list to follow, W2KMZ is undertaking to assist with the JZØKF (Netherlands New Guinea) QSL chores.

BV2AX, Lt. Col. Marion R. Graham, USAF, (W6HRN) Air Force Section MAAG Formosa, APO 63, % Postmaster, San Francisco
CEØAC, (QSL via RCC)
CEØAD, (QSL via RCC)
CM1AF, Armin Felipe Gonzales, Apartado 38, Artimesa, Cuba
CM2JU, Juan Anguelin, Guanada, Havana, Cuba
CR7CU, Eddie Schultz (W5TCM), % Rivers Fortier, Jeanerette, La.
GC3IDP, 12 Princess Pl., Greve D'Azette, St. Clements, Jersey, Channel Islands
GD3HFC, F. B. Arrowsmith, Fernleigh, Marine Parade, Peel, Isle o Man
HH3RC, Rev. Roger Colvin (W3PWH), Box, Cap-Haitien, Haiti
I1AYX, Dr. Piero Scioli, Post Box 105, Milan, Italy
JY1US, Jim Davis, % American Embassy, 'Amman, Jordan
JZØKF, (QSL via W2KMZ)
KP4VC, P. O. Box 744, Ponce, P. R.
KR6AA, Col. Fred B. Westervelt, Surgeon, RYCOM, APO 331, % Postmaster, San Francisco, Calif.
KR6MO, W. W. Deane (W6RET), 4524 Fountain Ave., Los Angeles
LA3J, Chr. Becker, P. O. Box 898, Stabekk, Oslo, Norway
OD5AV, (ex-OD5BH) P. O. Box 235, Tripoli, Lebanon
OH2RA/M, (QSL to OH2RA)
SM3CND, Lasse Ekstrom, KA5, Härnösand, Sweden
VK1EG, (QSL via VK4FJ)
VK4GI, N. Jones, 31 Swan Terrace, Windsor, Brisbane, Queensland, Australia
VP2DL, Merritt L. Heath, P. O. Box 103, Roseau, Dominica, B. W. I.
VS2DB, S. A. Faulkner, Inland Revenue Dept., Kuala Lumpur, Malaya
VS6CR, F. Johnstone, 164 Eu. Gardens, Top Flat, Argyle St., Kowloon, Hong Kong
WØRLG/VO4, APO 864, % Postmaster, New York, N. Y.
YN4CB, Hermano Pat, Box 10, Bluefields, Nicaragua
YU1AD, Mirko Voznjak, 152 Bate Sekulica, Belgrade, Yugoslavia
ZB1BR, (QSL via W2ISW)

Pitchers-in **W**1s APA BTQ JOJ RB WPO ZDP, W2s GT LYO WZ, W3AXT, W6s AM GPB KJR, **WØ**IUB and SWL LeRoy Waite deserve your thanks for the list preceding. If *you* should encounter the previously unpublished address of an active or imminently active DX station or the present QTH of an ex-DX licensee, ship it along to Jeeves as a boon to others in need.

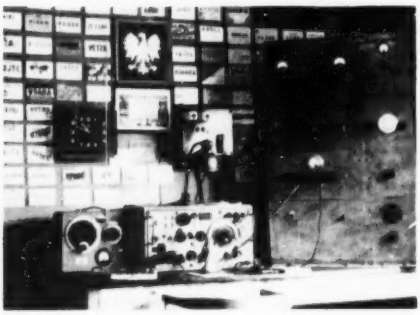
Tidbits:

Asia — From W6HRN based in Formosa: "Recently I have obtained a call sign and permission to operate on the ham bands. The Chinese Nationalist Ministry of Communications has assigned the prefix 'BV' for amateur use, with a number corresponding to the particular 'hsien' or county. My call is BV2AX and is the first and only legal call sign thus far issued in Formosa." Marion goes on to say that operation now engaged in by various C3s is tolerated by the authorities although such work is closely monitored. "As far as I know, the only amateurs on the air are either American or British, and the calls in use were issued on the mainland prior to 1949." BV2AX reports conditions on the higher frequencies generally poor in BV-land, with much non-ham work cluttering up the amateur bands . . . . . Twenty-meter A3 work is still popular in India although VU2s haven't been breaking through the magnetic curtains too



Doug Berry, ZK1BG, likes to hit all DX bands and currently has been startling the 80-meter W/VE crowd with the HF-100 rig at left. (*Photo via W6YY*)

well. VU2BH works the band with a 6L6-807s c.c. rig (final doubling), HRO receiver and dipole. VU2EH gets along fine with paralled 1625s in the final, a 3-el. spinner and BC-348 inhaler . . . . . KH6LP, very active on 20, is W1ZAC when back home in Millbury, Mass. . . . . 4X4CJ is back on the air after a 2-year layoff "in time for the forthcoming ARRL contest." He has an S-76, an Elmac exciter and several ground-planes . . . . . W2GT has it that KR6AA (W4VE, ex-KA2AA-KA9AA) QSLs only upon



For this view of the operating position at SP2KAC we are indebted to W8IV. Several SP hams man this station and its signals are widely heard and worked.

receipt after having been somewhat disappointed by returns in Japan. That's reasonable . . . . . From the HZ1AB gang: Scotty, W4TST, will leave Saudi Arabia and, by coincidence, will be relieved by old buddy W9ERG. Commenting on current weird propagation conditions, W4TST writes — "Just never know when the U. S. A. might come through here for it seems that this is a very strange place for radio conditions. At present we hear the U. S. from about 1330 to 1530 [local time]. It is odd the way the skip breaks through . . . worked W1MCW one day at high noon when it was 3 A.M. in the States. At 10 A.M. about a month ago I heard KZ5WA coming through and he was in for about 45 minutes with a terrific signal, the only station I could hear. We listen to WWVH [Hawaii] from the east-northeast and then the very next day they will come through from the west-southwest." These comments pertain to the 14–15-Mc. range. When Scotty gets back home he'll find conditions just about as goofy in this neck of the woods . . . . . VS6CR, who *likes* to work Ws, inhabits 20 meters almost daily except Sat. and Sun. between 2300 and 0500 GCT. This from W2WZ . . . . . KA2s HP EF BS and TT are pres., v.p., sec.-treas. and bulletin editor, respectively, of the Far East Amateur Radio League. FEARL, as you probably know, is to KAs what JARL is to JAs. The KA gang is talking up a 2-meter net and we note in FEARL *News* that KA2YK runs a code class for Boy Scouts and their parents. Many KAs are plugging for mobile-station authorization in Japan — it's taboo at present.

Africa — OQ5CP of Elizabethville told W3AXT to let the boys know he's gunning for Ala., Colo., Ia. and Mo. to complete his WAS. He seems to need only "easy" ones . . . . . We've heard that ZS9I frowns on the traditional custom of QSLing. Perhaps he's just behind the backlog . . . . . "You are cracking up, pal, and I can prove it!" writes eagle-eyed W2GVZ. Pat does prove it, too, pointing out that we credited EA9DD with 1436 hours of operating time over a ten-day seige in Rio de Oro, a very slick trick if EA4BH could have managed it. Shall we say 143.67? 'Tis bandied about that Rio de Oro will see more EA9 action ere many moons have passed . . . . . Although VQ3EO's QSL bears a Uganda QTH it's still a Tanganyika confirmation. Kikagati happens to be the nearest usable P.O. . . . . ZE6JF, the first Southern Rhodesia Six we've spotted, runs 80 watts to an 807, receives with an S-40A and sports a dipole radiator. Neighbor ZE3JP is ex-G8IJ . . . . . Fifty watts, a long-wire antenna and an SX-28 get good 14-Mc. results at ZS3T . . . . . Bangui's FQ8AI is ex-F9MT. He likes 20 'phone with a 45-watter and BC-312 . . . . . One of the most active Algerian stations on 20, FA3HH goes about his world-wide work with a 6V6-6V6-807 40-watt rig, a Windom skywire and Marconi receiver . . . . . W6BYB was first W6 for ZD4BN, who gets along well with a 3-tube receiver, folded dipole, and 4-stage 20-watter . . . . . That large 21-Mc. signal from VQ4EH is caused by 120 watts feeding a 3-wavelength zepp. VQ4EA uses the same kind of antenna, 60–100 watts to an 807, and an SX-28 on 14-Mc. 'phone.

Oceania — W9GVZ, of W9AVJ's Salt Creek Radio Club crew, favored us with a most interesting letter in which he calls attention to ZL1OF's being chosen as the pilot for Queen Elizabeth's recent tour of Pacific islands. Doug otherwise is regularly workable on twenty meters. W9GVZ also comments on Guamanian aeromobile work by KG6ABN . . . . . A few lines from KB6BA of Canton: "After over a year off the air I have returned to 40 c.w., 7000–7050 kc., with VFO, 60 watts, a long-wire antenna and an HQ-140X. . . . My wife is interested in obtaining a Novice license and the code machine is getting a workout. [She'll] be the first and only WB6 on Canton." KB6BA's previously held calls are KH6AMZ, MARS AB6AMZ, WØASN and KL7CB. He'll be active on 40 through 10 meters shortly, A1 and A3, with paralled 6146s and 4D32 finals . . . . . Taking off for Antarctic areas, VK1EG (VK2EG) pens, "Am also postmaster down there so will be giving quite a few Ws new first-day cancellations on our stamps." Bill will be running regular schedules with VK4FJ and, when not thus QRL, will QSO and QSL as many other stations as possible . . . . . KG6AEX, with a 500-watt 833A final on 15 'phone, is ex-KP6AA-W3CRW-KH6AEX. Steve receives with an HRO and radiates with stacked 8JKs . . . . . VK9YY, who helps with JZØKF's QSL chores, tells W2KMZ that VK9WZ operates 20 c.w. on Momote of the Admiralties; VK9WL represents New Ireland on the same band; JZØKF hangs around 14,080 and 14,132 kc.; ZC3AA is a joker; and FW8BB is about to percolate on Wallis. The Wallis and Futuna Islands, by the way, are included with New Caledonia on the List . . . . . Norfolk Islanders VK9s, GM OK and RS all three soon will be available, according to No. Calif. DX Club's *DXer*.

Europe — We receive a steady flow of inquiries from those who first encounter the LB prefix. Norway's use of the LB label in lieu of the usual LA job is akin to our slant-numeral "portable" designation. LBs are not necessarily outside Norway although it's not wise to pass 'em up — they *could* be on Spitzbergen or Jan Mayen . . . . . DL9LJ, laid up in a Karlsruhe hospital, needed only a

RAF Sgt. Frank Johnstone at the controls of his neat and compact Somerset station, G3IDC. Perhaps you know him better as former VS9GT and MP4BAB. G3IDC is DXCC.

month to work 14 countries with a couple of watts on 14 Mc. Jens, much better now, is about to fire up a 100-watt 20-meter s.s.b. rig at home. This via DL4RP-W5JYX . . . . . Those DM2s are becoming rather numerous. DM2ACM, active on several bands, uses a 5-stage 70-watter, an HRO and a 40-meter Windom. DM2ABL fires 200 watts into an 80-meter half wave on 21 Mc.; Heinz dissects the QRM with a 15-tube super . . . . . SM3CND operates Swedish military-amateur station SL3AU. Lasse has a Vee beam, 100 watts and a 15-tube super at the home QTH. SL5BO is operated by SM7CT OY2Z

(Continued on page 120)

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

PORTABLE operation from the high spots has become something of a tradition in our spring and fall v.h.f. contests. The mountain expeditions arranged for these parties make things more interesting for all of us, but we hardly expected anyone to try it for the V.H.F. Sweepstakes, January 9th and 10th! It was something of a surprise, then, to learn that several v.h.f. stalwarts had braved deep snows, freezing rains, high winds and near-zero temperatures to get out to their favorite locations for what is certain to be our greatest v.h.f. contest.

Logs are still rolling in as we write, so no accurate estimate of the total number is possible, much less a comprehensive story of the contest, but from the height of the pile already in we feel sure that new record for v.h.f. contest participation will be set by the 7th Annual V.H.F. SS. Glancing through the reports it is quite obvious that scores and enthusiasm were at an all-time high, many regular participants piling up two or three times their best previous records.

Comments to follow are based on incomplete records and claimed scores; the final story will not be known until checking of the logs is completed. Top score in the country: W1RFU, Wilbraham, Mass., with 153 contacts in 13 ARRL sections, for 3965 points, an all-time record. Largest number of contacts on one band: W3IBH, Philadelphia, 194 on 144 Mc. in 9 sections, 3492 points, also a record. Most contacts by one operator: W2COT, Maplewood, N. J., 216 in 6 sections, 2532 points. Outstanding YL scores: W2FHJ, 150 in 8, for 2400; W2FBZ, 209 in 7 for 2926; W8BFQ, 136 in 12 for 3252; W6QGX, 130 in 3 for 780.

There was a heartening increase in activity and reporting in areas where these factors have been low or completely lacking in the past. Some fine logs came from the Two Meters and Down Club in Los Angeles, the Pacific Northwest was well represented, and scores in the Chicago area were many times previous levels.

One of the outstanding contest jobs, not only in this affair but for all time, was the piling up of 137 contacts in 12 sections for 3288 points by W8WXV, Shiloh, Ohio. Al turned this neat trick on 144 Mc. only, and nosed out W8BFQ by a single contact for the Ohio Section leadership. W9WOK, Bensenville, Ill., set a mark for W9s to shoot at in the future, with 135 contacts in 9 sections, 2430 points, also entirely on 144 Mc. Over a hundred contacts, no mean accomplishment on the West Coast, were turned in by W6TFZ, San Mateo, 127 in 5, 1270; W6CGA, Redwood City, with the same score; W6YEQ, San Carlos, 119 in 5, 1185; and W6QGX, Puente, 130 in 3, 780.

Club efforts were phenomenal. The South Jersey Amateur Radio Association appears to have earned another gavel, but the Dayton (Ohio) Amateur Radio Association showed that being along the New York–Philadelphia axis is not a requisite to high club scoring. In their

* V.H.F. Editor, *QST*.

50 WAS Mc.

WØZJB	48	W5VY	48	W8OJN	39
WØBJV	48	W5MJD	47	W8LPD	37
WØCJS	48	W5GNQ	46		
W5AJG	48	W5ONS	45	W9ZHB	48
W9ZHL	48	W5JTI	44	W9QUV	48
W9OCA	48	W5ML	44	W9HGE	47
W6OB	48	W5JLY	43	W9PK	47
WØINI	48	W5JME	43	W9VZP	47
W1HDQ	48	W5SFW	44	W9RQM	47
		W5VV	42	W9ALU	47
W1CLS	46	W5FAL	41	W9QKM	46
W1CGY	46	W5ESC	41	W9UIA	45
W1LLL	46	W5HLD	40	W9UNS	45
W1LSN	44	W5HEZ	38		
W1HMS	43	W5LIU	37	WØQIN	47
W1DJ	41	W5FXN	37	WØDZM	47
				WØNFM	47
W2AMJ	46	W6WNN	48	WØTKX	47
W2MEU	46	W6ANN	45	WØKYF	47
W2RLV	45	W6TMI	45	WØHVW	45
W2IDZ	45	W6IWS	41	WØMVG	44
W2FHJ	44	W6OVK	40	WØJOL	44
W2GYV	40	W6GCG	35	WØTJF	44
W2QVH	38	W6BWG	29	WØWKB	43
W2ZUW	35			WØJHS	43
		W7HEA	47	WØPKD	43
W3OJU	46	W7ERA	47	WØIPI	41
W3NKM	41	W7BQX	47		
W3MQU	39	W7FDJ	46	VE3ANY	42
W3RUE	37	W7DYD	45	VE3AET	41
W3OTC	37	W7JRG	44	VE1QZ	34
W3FPH	35	W7BOC	42	VE1QY	31
		W7JPA	42	XE1GE	25
W4FBH	46	W7FIV	41	CO6WW	21
W4EQM	44	W7CAM	40		
W4QN	44	W7ACD	40		
W4FWH	42			Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.	
W4CPZ	42	W8NSS	46		
W4FLW	42	W8NQD	45		
W4OXC	41	W8UZ	45		
W4MS	40	W8CMS	43		
W4ENR	39	W8YLS	41		
W4IUJ	38	W8RFW	41		
W4BEN	35	W8BFQ	42		

first try at v.h.f. competition they turned in a claimed score of more than 12,000 points. Local club rivalries and intensive organizational work boosted many club totals severalfold and added fun for all concerned. Club records, last in the checking procedure, will have to await at least one more *QST* deadline.

First prize for effort (and discomfort) goes to W3PZK. Bal has been going up to a mountain location near Charles Town, W. Va., in the spring and fall parties for some years, in order to provide that hard-to-get section for stations in the East. The weather around Washington wasn't too bad on Saturday, so he decided to try the trip the second day of the contest. Snow encountered about halfway along the 55-mile drive from Washington should have been warning enough, but Bal refused to turn back, and made his destination shortly after noon.

Weather was getting worse every minute, and the 1500-watt generator refused to start, but he stuck with it, and after more than four hours managed to get things rolling. Setting up the gear inside an abandoned log house (complete with broken windows and heated by two 100-watt lamps and a soldering iron) W3PZK/8 was on the air from 6 P.M. to the end of the contest. By midnight there was 6 inches of snow, and more piling up rapidly, so Bal announced to the Washington gang that he was going to spend the night on the ridge in his car, rather than try to get out in the storm.

Skeds were arranged for the following morning, but the generator wouldn't start, and a state police search was set in motion by hams who feared the worst had happened to W3PZK/8. It hadn't, however; Bal finally got out in one piece and is now busily planning the expedition for next June's party. On the line for names of operators sharing the work, Bal's contest form shows "one unidentified field mouse, who, though of no help physically, was a tremendous moral support!"

There were many other stories of ice-covered hills, unheated towers, cold attic shacks and frozen rotators, but it was a fine contest even so. It takes more than a little wintry weather to slow down a v.h.f. enthusiast! Full story next month.

Here and There on the V.H.F. Bands

Six-meter news has been all too scarce in recent months. Even the anticipated midwinter sporadic-*E* season failed to produce many contacts, mostly because of too few fellows trying. W5SFW, W3OTC, and W6BWG are the only 6-meter men to report working E_s DX in December and January, and one night your conductor found the band obviously well open, but only W9QKM on there to provide a contact.

There was no lack of use in a few other countries, however. VK5JD reports that VK2, 3, 5, 6, 7 and 9 and ZL1, 2, 3, 4 and VR2 were worked from VK5 in their (summer) sporadic-*E* season that peaks in December and January. He has a report of a contact between VK3 and KG6, though details are lacking. Sporadic-*E* DX was running up to at least 82 Mc., as there was widespread intercity QRM in their mobile-service band between 72 and 82 Mc.

From Santiago, Chile, CE3QC reports that the 50-Mc. band obliged by opening up to Argentina on the first day of the 50-Mc. contest sponsored by the Radio Club of Chile. Beginning at 1810 on the 19th, the band was open both east and north for more than two hours and CE3s CC PX QG RO ET RQ and QC made many contacts with LUs in Buenos Aires and Mar del Plata, and with CE1AH, all distances of more than 500 miles. The band was active again the following day, though with conditions inferior to those on the 19th. The next opening came on January 11th, to LU only.

In northeastern United States, the fellows who feel that the only good v.h.f. conditions come in the summer months missed some good bets in late January. The period from Jan. 23rd to 26th saw an almost continuous inversion prevailing along the Atlantic Seaboard and west to the Great Lakes. W8WXV, W8BFQ, W9WOK, W2ORI, W2UK and others who keep regular schedules found that 144-Mc. signals were far above normal for several evenings. W8WXV worked W1HDQ, about 500 miles, on the 25th, and W8BFQ's signal at the writer's location was as strong as at any time during the summer and fall inversion period in 1953. It is probable that this fortunate condition would have been missed entirely, had it not been for the regular skeds, however, as random operation seldom finds beams lined up in the right directions at the right times to bring such conditions to light. Few random contacts were made over more than the usual distances during this period, as most of the gang simply do not bother to look for signals beyond the local range at this season of the year!

When W4HHK, Collierville, Tenn., kept his 0630 sked with W2UK on the morning of January 25th, he got the surprise of his 2-meter life, for there was W2UK rolling in with a solid c.w. signal, instead of the customary isolated meteor pings. The signal was copied solidly for two minutes, and during a high percentage of the balance of W2UK's 5-minute transmission. No tropospheric DX in winter, did someone say?

Our picture story, "So-o-o Big!", in December *QST* created lots of interest, judging by the number of letters we receive asking for more details on the big 144-Mc. antennas described therein. Many people want to know, for instance, how W1VLH feeds his 32-element job. Mason's

W2SC Operation with Big Dish Delayed

In case you were looking for W2SC on 144.7 Mc. and didn't hear them in January, we report that the date for putting the station on the air was missed due to delays in the construction of the antenna system. As we go to press, operation is scheduled for mid-February. Watch W1AW and other Official Bulletin Stations for latest information.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951

220 Mc.: W5AXY, W5BDT — W5RCI
520 Miles — October 5, 1952

420 Mc.: W1RFU — W4TLM
410 Miles — July 26, 1953

1215 Mc.: G3QC/P — G8DD/P
100 Miles — July 26, 1953

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945

10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1947

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

array is composed of two 16-element arrays that are almost exact duplicates of the all-metal design shown in recent editions of the *Handbook*. They are joined at their centers by one-wavelength phasing lines of open-wire construction. These two lines are in turn joined and fed through an adjustable "Q" section, the main transmission line being 450-ohm open-wire line.

The 104-element colossus of W3QKI, shown in the same article, has been dismantled, but we haven't heard the last of its builder. Herb has now migrated to Sherman Oaks, Calif., where he is already hard at work on designs for bigger and better 2-meter beams. W3QKI/6 finds 2-meter operation in the Los Angeles area quite different from what he knew in the East. There is a phenomenal number of stations, but largely operating with ground planes and dipoles, or with mobile gear. They even use the upper part of the band, which is perhaps the strangest aspect of all for a 2-meter DX hound accustomed to the edge-crowding tactics of the high-power big-antenna operators of the East and Middle West.

Up to the early part of the winter there was no sign of the usual lull in 2-meter activity in the area around Wichita, Kansas, according to WØZJB's V.H.F. Newsletter. (You "subscribe" to this newsy mimeograph by sending large-sized stamped self-addressed envelopes to WØZJB, Box 1257, Wichita, Kan.) Vince says that a rash of 16-element beams, higher power and crystal-controlled converters has brought coverage up to a point where 200-mile stuff is no longer considered DX, but routine work, to be expected daily. Not a few newcomers to 144 Mc. have been picked up from the bulging 75-meter band, and these fellows are amazed to find that they can work 100 miles or more with good signals on 2 with a fraction of the power they burned up fighting the squeals on 75.

A big wind late in the fall put W7LEE, Parker, Arizona, out of business, bringing down his 48-element 2-meter beam, tower and all. Bob has repaired the damage and now has the big array securely mounted on a telegraph pole. His list of stations worked now includes 21 W6s and 6 W7s, the W6s all being worked over what would appear to be an almost impossible path.

The gatherings of VE3s and Western New York W2s held at Oakville Lodge, near Toronto, have become a well-established feature of life on the v.h.f. bands in this area. The most recent was held the night of January 15th, at which VE3DIR took over the 2-meter trophy from former holder VE3AIB. Les won the 6-meter award, however, so the spot on the mantle is still occupied. These trophies are awarded on the basis of showings in the annual V.H.F. SS Contest. A feature of the evening was an antenna talk by W2ORI, Lockport, N. Y., who was nominated for the job on the spur of the moment.

Two more TV enthusiasts: W3RMJ, Manheim, Pa., has a closed-circuit set-up operating with a Vidicon camera built into a 3 by 5 by 10-inch case. At present, he is using the sync from a local TV station, but a 5-tube sync generator providing interlaced 525-line 60-frame scanning and locking into the 60-cycle line frequency is under construction. An r.f. section for operation on 444 Mc. is also in the works. W3RLR, Baltimore, Md., has the equipment described in November *QST* just about completed and hopes to be on the air with an r.f. section before long.

Talk of 1215 Mc. comes from three sources this month. W4NDE, Oak Ridge, Tenn., writes that he and W4s SUI and SGI are making a winter project of preparations for that band. W3LZD, Dunmore, Pa., is trying to get on 1296 Mc. with a pair of 2C39s tripling from 432 Mc. WØTMJ, Odessa, Mo., is reported to be experimenting with 1200 Mc.

Results in the 420-Mc. antenna contest conducted January 8th by the U.H.F. Club of Jamaica, N. Y., probably did not contribute any startling new theories to be added to antenna literature, but the whole thing was more fun than anything the club has done in many a moon. Arrays entered included corner reflectors of 60 and 90 degrees, several Yagis of 5 to 10 elements, a bow-tie with plane reflector, a Quadrapole and a Lazy H, with W2s OKX OTA AOD ZPG DVK LMV QPQ and K2BBO as contestants. The 60-degree corner jobs by OKX and OTA showed up best, but these boys were judges of the affair, so were disqualified. The bow-tie yielded the highest field-strength/hours-of-labor result, being made largely of aluminum foil and cardboard.

Next club project: demonstration of the construction of a simple 420-Mc. receiver by W2OKX and W2ZPG. The club has a number of young members who are coming up via the Novice route, and this sort of thing has done much to keep them from following the all-too-familiar commercial-gear approach ham radio. It is also building U.H.F. Club interest to an all-time high, both objectives of the highest order.

2-METER STANDINGS

	States	Call Areas		Miles		States	Call Areas		Miles
W1HDQ	18	6		850	W6WSQ	3	3		1390
W1IZY	16	6		750	W6BAZ	3	2		320
W1RFU	15	7		1150	W6NLZ	2	2		237
W1MNF	14	5		600	W6GCG	2	2		210
W1BCN	14	5		580	W6QAC	2	2		200
W1DJK	13	5		520	W6EXH	2	2		193
W1MMN	10	5		520					
					W7LEE	3	2		240
W2UK	23	7		1075	W7YZU	3	2		240
W2NLY	22	7		1050	W7JU	2	2		140
W2ORI	21	8		1000	W7JUO	2	2		140
W2AZL	20	7		1050	W7RAP	2	1		165
W2QED	19	7		1020					
W2PAU	16	6		740	W8BFQ	24	8		775
W2AMJ	14	5		550	W8WJC	24	8		775
W2BLV	14	5		450	W8WXV	21	8		1200
W2QNZ	14	5		400	W8WRN	20	8		670
W2UTH	13	7		880	W8DX	19	7		675
W2SFK	13	6		—	W8BAX	19	7		655
W2AOC	13	5		400	W8UKS	18	7		720
W2DFV	13	5		350	W8RMH	18	7		690
W2CET	13	5		405	W8RWW	17	7		630
					W8EP	17	7		—
W3QKI	22	8		820	W8WSE	16	7		830
W3RUE	20	7		760					
W3NKM	19	7		660	W9EHX	23	7		725
W3KWL	16	7		720	W9EVJ	22	8		850
W3LNA	16	7		720	W9EQC	21	8		820
W3FPH	15	7		—	W9BPV	20	7		1000
W3GKP	15	6		800	W9UCH	20	7		750
W3IBH	13	5		570	W9LF	19	—		—
					W9WOK	17	6		600
W4HHK	23	7		850	W9ZHL	17	6		—
W4AO	21	7		950	W9MBI	16	7		660
W4JFV	18	7		830	W9KLR	16	7		—
W4MKJ	16	7		665	W9BOV	15	6		—
W4OXC	14	7		500	W9LEE	14	6		780
W4JHC	14	5		720	W9DDG	14	6		700
W4IKZ	13	5		720	W9FAN	13	—		680
W4JFU	13	5		720	W9UIA	12	7		540
W4UMF	13	5		600	W9GTA	11	5		540
W4WCB	9	4		650	W9JBF	10	5		760
W4UDQ	8	4		850	W9DSP	10	4		700
W4TLA	7	4		850					
					WØEMS	24	8		1175
W5RCI	20	7		925	WØGUD	22	7		1065
W5JTI	14	5		670	WØHHD	19	7		725
W5QNL	10	5		1400	WØONQ	17	6		1090
W5CVW	10	5		1180	WØINI	14	6		830
W5AJG	10	4		1260	WØZJB	12	7		1097
W5MWW	9	4		570	WØOAC	12	5		725
W5ML	9	3		700	WØWGZ	11	5		760
W5ABN	9	3		780					
W5ERD	8	3		570	VE3AIB	20	8		890
W5VX	7	4		—	VE3DIR	17	7		790
W5VY	7	3		1200	VE3BQN	14	7		790
W5FEK	7	2		580	VE3BPB	12	6		715
W5ONS	7	2		950	VE3AQG	11	7		800
					VE1QY	11	4		900
W6ZL	3	3		1400	VE3DER	10	6		800
W6PJA	3	3		1390	VE2AOK	7	3		440

OES Notes

The big news from the OES group continues to be the work of W4HHK, Collierville, Tenn., in receiving the signals of W2UK, New Brunswick, N. J., over a 940-mile path on 144 Mc. Two morning and two evening schedules

(Continued on page 124)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHILLIP SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, WN1ZJE, Administrative Aide

The Novice Round-up. The "NR" this year was the biggest one yet. Apparently more and more WNs are appreciating that the ARRL Novice Round-up can be considered a device to bring them more contacts than they could otherwise make in 15 days in January. One can get fun and station coverage from it, whether caring about the scoring or not. Rules for sending a number that moves ahead *one* as each contact is made (and with the name of the section or state) seem about as simple as one can make it. But there were some answering CQ NR who seemingly could not break their "QTH-report formula" for any new kind of exchange. Would it help looking ahead to another January, if the rules made it optional to put down the signal report with city and state (from QTH) *in lieu of the standard exchange* when it is not forthcoming — to facilitate counting contacts with those WNs who early in the activity haven't learned what other numbers to send? Frank comments pro and con will be appreciated.

Teen-Age Nets. All who are currently getting copies of the new Net Directory (gratis from ARRL on radiogram or letter request) will note several new nets, operated *exclusively* by teen-age amateurs. The teen-age nets are a fine example of enthusiastic and well ordered teamwork in the traffic handling field. This is to credit their members, organizers and net managers. Some representatives of the individual nets and their frequencies: W1UTH, 7175 kc.; W2JOA, 3630 kc.; W2JML, 3825 kc.; W8LQZ, 3825 kc.; and W6SQY, 7297.5 kc.

Bob Meehan of W1UTH and a group of active Teen-Age Netters, in a recent visit to ARRL, reported on the popularity and objectives of their net operation. An aim where possible is full 7-day traffic coverage. The subject of possible tie-ins at section level with regular section nets was discussed, as well as an expanded program of net formations. Four purposes are set down by W1UTH as primary objectives in his net, the first known to us to operate as a TEEN-AGE NET: (1) Training in traffic handling. (2) Training in net procedure. (3) Advancement in code proficiency. (4) Building of fraternal radio relationships between teen-age amateurs.

ARRL is, of course, dedicated by rules set up by the Board to maintaining one single National Traffic System. Just as in emergency a "single strong facility" is desirable in AREC-RACES groups (and not competition between divided groups), we must work toward one single strong traffic facility. Just as some groups working together outside NTS have good tie-ins and national traffic distribution by having members that hold simultaneous membership in section nets, the teen-age nets reported above will no doubt continue to handle lots of traffic by such a device. As *every* new ham gets his General Class ticket we hope he will get into a net to suit his inclination; there's much to be learned in ordered operating dedicated to a purpose. There are high values of fraternalism as well as training, in working with accomplished disciplined operators. All this by way of explanation; our simple purpose here, a salute to the Teen-Age Nets.

Field Day Planning. Letters from club groups show many already looking forward in their plans to the June 19th–20th Field Day. On an *individual* basis, planning can be simplified to a review of and improvement of the equipment one now has. An advance workout is advisable of battery power and generators in home operating work, also the readying of new sets-with-handles and mobile gear that will permit you to contribute to your club's aggregate-mobile score this year or even give the club such a listing if it never had one! If any new parts are needed, right now is the time to get them.

For *club* groups more serious organizing is required. Improving antennas, equipment and operating efficiency will not "just happen" unless your club leaders profit from any previous experience. *Operational committees* still have some time to count noses and sign up operators, but meanwhile, last year's logs should be studied with care before making a tentative hour-by-hour operating schedule. The *location committee* must be one of the first activated, if a different location is for any reason desired. The *antenna and equipment committees* had better wait no longer; where there's work to be done responsibility for the modified gear or control set-up had better be fixed without delay if you wish to better your last year's records. The *commissary committee* has right up to H-hour to confer with members about their likes, and to correct overages or deficiencies after consulting last year's purchase records. Progress reports of club committees help to insure that everything isn't left until too late.

Now let's take a look at things that determine the values for the club and community and operator ability to get results in this coming ARRL FD. The Field Day should be much more than a contest or just an outing. More clubs (in these times) work *both* 'phone and c.w. In determining the transmitter class, separate Novice and v.h.f. set-ups now are receiving enthusiastic

recognition in many larger clubs as capable of making their own unique contribution of points. Certain clubs last year let the chips fall where they may as to simultaneous use in order to give these fellows a chance to see what they can produce. The more units operated, the larger the sum total of contacts and points that can be siphoned in; also the more operating experience for participants. This is all to the good unless you have some side bets with another club that requires the club to stay in the same transmitter class. More of the true *emergency exercise* and less of a contest set-up will also permit higher social values and some fun from the outing side of the Field Day. Speaking of the emergency exercise aspect, it's a good idea in *keeping prepared* to test emergency equipment at stated intervals wherever it can't be employed regularly; for example, the gasoline-powered back-up for W1AW gets tested twice a month whether otherwise required or not. Clubs and their individual members can profit greatly in the meetings between now and June by making such items as the following subjects for blackboard talks or demonstrations: (1) Field Day, emergency and good operating procedures including message handling; (2) standardized equipment-plugs and control circuits; (3) antenna and location plans; (4) packaging equipment units for rapid set up and dissembly. The matter of the FD is mentioned this early so operators can not only plan equipment betterment but also can give the equipment and operators needing experience a check-out in general operating, in CD Parties, etc., between now and the FD. FD rules have been distributed to all affiliated clubs; these will appear in full in June *QST*. FD log forms will become available on request in May.

On More Listening, Fewer CQs. A new operator slogan is suggested by W3CVE: LISTEN AND CALL MORE, CQ LESS. He writes, "For four months my only CQs have been *directional* and I have had all the QSOs I want. . . . Too many general CQs show bad taste. Old timers, remember how T.O.M. raved about those lids who would CQ continually for hours on end? If an operator listens more he will be able to pick his man and work with a purpose! Whether VFO or xtal, an operator who establishes himself on *one channel* for most of his work also will be surprised on how many calls he will get from stations that answer after a QSO or after short calls.

DX Test Dates. For those who come somewhat late to the DX fray, there's the second 'phone week end of the ARRL DX Competition coming up March 12th–14th, and likewise a second c.w. portion of this operation sheduled for March 26th–28th. If you had some success with DX in February here's a chance to extend your luck; if not, it's a fresh opportunity to grab off the countries that will be represented. Best luck and DX. Don't forget to mail in your results, large or small, as soon as each contest section is over; even postcards confirming individual contacts or exchanges are welcome.

— *F. E. H.*

Voice Procedure Tips:

SIGNING PORTABLE

Many amateurs operating *portable* for the first time are unaware of the particular method of identification required by FCC for 'phone operation. While the slant bar and

area numeral suffice for telegraphy, an announcement of the geographical location must be given after the station call for correct portable voice indication. Example: W7ABC, *this is* (or *from*) W6ABC portable at Fresno, California.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on March 12th at 2130 EST. Identical tests will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on March 7th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send with W1AW.

Date	Subject of Practice Text from January *QST*
Mar. 2nd:	*Getting the Most Out of Your Receiver*, p. 32
Mar. 4th:	*A Basic Tool Kit for the Novice*, p. 40
Mar. 8th:	*Three-Control Six-Band 813 Transmitter*, p. 11
Mar. 11th:	*Standing Waves and TVI*, p. 44
Mar. 15th:	*A Compact Beam for 40 and 20 Meters*, p. 17
Mar. 17th:	*The A.M. Equivalent of Single Sideband*, p. 19
Mar. 23rd:	*September V.H.F. Party Results*, p. 49
Mar. 26th:	*An Unusual 75-Meter Mobile Antenna*, p. 23
Mar. 30th:	*A Transistor Self-Powered C.W. Monitor*, p. 28

A.R.R.L. ACTIVITIES CALENDAR

Mar. 7th: CP Qualifying Run — W6OWP
Mar. 12th: CP Qualifying Run — W1AW
Mar. 12th–14th: DX Competition ('phone)
Mar. 26th–28th: DX Competition (c.w.)
Apr. 2nd: CP Qualifying Run — W6OWP
Apr. 10th–11th: CD QSO Party (c.w.)
Apr. 12th: CP Qualifying Run — W1AW
Apr. 17th–18th: CD QSO Party ('phone)
May 1st: CP Qualifying Run — W6OWP
May 11th: CP Qualifying Run — W1AW
June 5th–6th: V.H.F. QSO Party
June 6th: CP Qualifying Run — W6OWP
June 16th: CP Qualifying Run — W1AW
June 19th–20th: ARRL Field Day
July 2nd: CP Qualifying Run — W6OWP
July 15th: CP Qualifying Run — W1AW
July 17th–18th: CD QSO Party (c.w.)
July 24th–25th: CD QSO Party ('phone)

We have recently spent some time poring over the reports of the 1953 Simulated Emergency Test, held last October. Participation was down approximately 18% from last year, based on the number of reports received. With fewer reports, naturally other statistics similarly showed a decline. Detailed figures will be included in the SET write-up, which we hope to have in April *QST*, but a few generalizations here are in order.

A good many AREC groups took advantage of the broadening of the SET participation time and held their tests at times which would coincide with civil defense tests or drills. Thus, the civil defense participation was high; just slightly less than 50% of participating groups conducted their operation partly or entirely on RACES frequencies. Over 2500 amateurs are known to have participated in the SET.

Still, the decline from previous years is disturbing. What's the cause of it? Several possible reasons suggest themselves, but we think primarily it narrows down to two: (1) we didn't send out last-minute "reminder" cards this year, so many ECs whose groups participated did not submit formal reports; (2) the enthusiasm for civil defense, generated to a fever pitch shortly after the RACES frequencies were earmarked, is gradually dying down due to delays in vigorous implementation of this service. The first reason would indicate that participation did not fall off as much as the figures show, if at all. But the second is something we ought to try to do something about, if we can. Actually, civil defense inertia is something that is being felt elsewhere than just in communications. After the initial scare, it seems we have become used to the possibility of attack, have developed a tolerance to it and have become indolent.

Perhaps this is part of the communist plan; we don't know. But whether it is or is not, we amateurs who operate every day and who are organized to perform a service ought to continue to offer that service and urge that it be used, and thereby add our strength to the civil defense effort. Not only is this the least we can do for the good of our country, but it is what we *must* do for our *own* good.

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There have been several instances of unidentified carriers in the amateur bands which have been traced to civil defense amateur installations put into operation, either inadvertently or otherwise, by unauthorized personnel. The licensee of the station, we remind you, is responsible for any violations of FCC regulations in the station's operation, regardless of who actually operates it. Amateur stations located in c.d. control centers or other installations should be made inaccessible to other than authorized operating personnel; if this is not feasible, then the equipment should be rendered incapable of operation except by authorized operators. This could be accomplished by removal of crystals, tubes (the oscillator tube alone, for example) or fuses.

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During the month of October, 1953, many forest fires began to break out throughout the state of West Virginia. The Conservation Commission once again called upon amateur radio facilities, and under the direct guidance of W8PNR, Amateur Radio Coördinator for the West Virginia State Conservation Commission, facilities were organized on October 22nd. The main control station was that of EC W8CLX, operated by remote control from the Conservation Commission offices in Charleston. This formed a direct link between the main offices of the commission and their many areas of the state. Different areas were represented by many of the same amateur stations who operated so effectively a year ago under similar circumstances (see Feb., 1953, *QST*, p. 70). The frequency used was 3890 kc. Field stations included W8VPO, W8KEG/8 and W8BPI/8. Assisting principally as operators at W8CLX were W8BPI, W8DHX, W8RFD and W8ZJS. The following is a list of other amateur operators known to have assisted in the operation: W8s AEN AHF ALZ AQP AUG BAE BNL BSD BVZ BWD CCF CCX CTO DAR DDL DFC DGK DIP DIT DPF EDC EJY EKB EKF EMQ EOJ EPZ ESZ ETF EVR EZR FBY FGL FMU FPO FPT FRV FUM FVM FYD GGC GCZ GEP GEC GIO GQH GSW GTQ GUL HFC HLF HMC HOP HRN HRQ HRX HUP HWZ HZA HZH HZU IAJ IJH IRN JBH JDE JDF JNS JPV JRN JSD JSO JTB JZO KBM KBT KCN KHG KTH KUR KVR KXD KXO KWP LBT LPC LSY LYV MAD MAL/8 MIS MLR MYT NAY NBG NOV NYH OFO OHJ ORC ORD ORT PHY PRC PTM QHG RED RHZ SEK SGH SHU SPY TIS UAM UCA UDJ UDU UGK UPO UPW UYR VCA VDJ VDR VF WDJ WGX WHR WSD WSV WVF YAM YDJ YMN YOW YPN YPR YUS ZOJ, K8NAI, W3s FRV LSU SEK UAM, W4s AKY GRO JPV JZC MAD NOV OOS/8 PTM SBI UBC, W5s VAE VAJ and W9NAI. The Conservation Commission relaxed it vigilance on November 11th, since precipitation had been sufficient to lessen the danger. Amateur radio facilities remained on the alert for a short while thereafter. Carl Johnson, director of the West Virginia State Conservation Commission, used the press, radio stations and amateur networks to personally commend the amateurs for their participation. — *W8YPR, SEC W. Va.*

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That sleet storm in Minnesota (see p. 58, Feb. *QST*) had things pretty well messed up in South Dakota, too, according to reports from SEC WØGCP, PAM WØNJQ and SCM WØRRN. On Nov. 20th, amateur radio was partially responsible for issuance of South Dakota Drivers' Permits on schedule. WØGCP was asked by a printer in Stickney to contact a printing concern in St. Paul, since wires were down. WØJDO was contacted and made the necessary liaison between the two printing concerns which permitted South Dakota to end on schedule its distinction of being the only state not to require drivers' licenses. In Brookings, amateurs were instrumental in effecting communications between the Brookings Municipal Power Plant and Otttertail Power Company which resulted in many areas being supplied electric current which otherwise would not have had it. Active in this undertaking were Wøs FBD MZJ GNS BON OQQ EOX KJN DJT HVY NEO RBS ORJ LUP HPN ELC BNA FKE, KØWAD, W9s ACQ and WAM. WØRRN tells us that the telephone company suffered extensive damage to the tune of about 700 broken poles and about 11,000 wire breaks in a 50-by-50 mile area.

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The town of Sibley, Iowa, had no wire service, either telephone or telegraph, from Dec 3rd to Dec. 6th as a result of a sleet storm. WØFYC was the sole contact with the outside world during most of that time. His first message was for the Bell Telephone Co. to their office in Sioux City, advising them that Sibley was isolated. WØAZR handled this one. The second was a message from a doctor in Sibley to another doctor in Sioux City, handled by WØCGF, but most of the traffic was for the Rock Island Railroad. WØFGC, another Sibley amateur, assisted in contacting Sioux Falls, S. Dak., by informing WØNJQ at Brookings of the need for

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A few of the principals in the Vicksburg tornado got together for this group photo after the excitement was over. Sitting, *l. to r.*, W5s KUT RLP ART QYZ LN WMR; standing, *l. to r.*, W5VMB and W5SQU.

such a contact. WØNJQ telephoned WØPHR, who was on the air within a few minutes. The information thus passed along was then filtered down by telephone to points of action. Additional stations assisting in these operations included W0s CZ IYW CSP KJN HNE BLZ and TTT. WØFYC heard other Iowa stations handling emergency traffic, but did not record their calls.

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On Saturday, Dec. 5th, at 1730 CST, a howling tornado roared into the middle of Vicksburg, Miss., at that time crowded with Christmas shoppers. For fifteen minutes the tornado spread death and destruction through the heart of the city. Within twenty minutes the first amateur stations got on the air, to find lights, gas and water off and communications disrupted. In two and a half hours many amateurs were on, serving as the backbone of the communications system. W5ART was in constant contact with city officials, calling for firefighting equipment, plasma, lighting equipment and other necessities from surrounding towns. In Vicksburg alone, amateurs spent over 250 man-hours on the air, handled over 1000 emergency messages. Participating stations were W5s ART LN QYZ MRW SQU VMB and KUT. W4ODR, the Naval Air Station at Millington, Tenn., was on for 50 hours and handled 300 messages; operators were K2BAS and W5URJ. Also participating were W5s NG ZLR WZZ PFC VQE TDO VKV IMT IVO BGU CQJ IVS EYY RIM ITL JHS OTD CEW KHB and many others. Across in Tennessee, W4AGC predicted the tornado (see p. 39, Nov., 1953, *QST*) and had the c.w. net alerted hours before the storm hit Vicksburg. Tennessee amateurs who assisted in tornado operations were W4s RRV RLD OEZ IWV PFP YNK SUH FK RHO VUA CV and NJE. W4RO and W4SCF drove from Memphis to Clarksdale, but no communication was needed. On the way back, they assisted in calling via W5s LN GG and LVG state police aid to a very serious highway accident.

The above information comes from Miss. SCM W5OTD, Tenn. SCM W4CXY and Tenn. SEC W4NJE.

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An emergency call from K5WAS and K5FAL at Fort Bliss and Biggs AFB was received about 1600, Dec. 11th, requesting assistance from the El Paso Ten Meter Emergency Net in locating a B-36 plane crash on the west side of Mount Franklin. Within 15 minutes, units from the net were on the scene relaying information back to Biggs Air Force Base. W5QEZ/M, with W5BFU, operated as close to the scene of the crash as possible. W5SGA/M, also operating close to the crash, was relaying information to Biggs via K5WAS at Fort Bliss who maintained telephone contact with the air base. WØHTY climbed Mount Franklin with a pack rig and gave spot information to W5RZB at the base of the mountain, where it was relayed to Biggs. W5WNT arrived at the scene shortly after W5SGA, and immediately went into action relaying information to Biggs. W4KMZ/M relayed Air Force orders and information through W5FSH to Fort Bliss and Biggs AFB. W4KMZ was later relieved by W5BQU, who was operating mobile on the top of Scenic Drive, controlling operations and relaying information from stations close to the scene to Biggs Field. W1KUX/M was operating near Crazy Cat Canyon helping the Air Force coördinate their operations, requesting supplies and equipment. When darkness set in, he helped the Air Force position their searchlights to illuminate the crash area. W5KBP was active relaying information to Biggs AFB and Fort Bliss, also relaying telephone calls to the families of rescue personnel. W5UBN took over as NCS from his home station late in the evening, relieving W5BQU/M. W5QVJ assisted at W5UBN. The Emergency Net operators were deputized and aided in controlling traffic where needed, along with their other activities. Photographers and newsmen were also aided by the net in this operation. The net was in operation continuously for more than nine hours, and is proud of this, its first real disaster operation.

— *W5BQU, Net Control and W1KUX, Asst. NCS*

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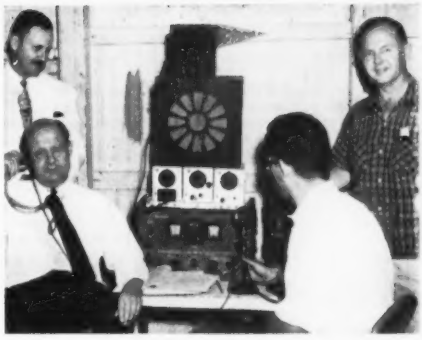
November SEC reports were received from the SECs of Montana, West Va., New Mexico, East Bay, Los Angeles, Nevada, Western N. Y., Eastern Fla., Wisconsin, Tennessee, Santa Clara Valley and South Dakota. Montana is a new one, and makes the total for the year twenty-five sections, out of a possible 73. November reports represented 2700 AREC members, out of a possible 30,000 or so.



Governor Val Peterson, head of Federal Civil Defense, during a recent visit to Puerto Rico, gave a speech at the University in which he considered "communications as one of the most important things when emergency strikes." Later, he visited the amateur radio set-up at the civil defense Control Center in Gurabo during an emergency drill. Shown in the photo are Gov. Peterson (with headphones) and KP4BK. Standing are KP4PW and KP4DV.

DX CENTURY CLUB AWARDS

HONOR ROLL

W8HGW	253	W6ENV	245	W3JTC	242
W1FH	252	W2BXA	244	W3KT	241
W3BES	250	W3GHD	243	LU6DJX	241
G2PL	250	W6AM	243	PA0UN	241
W6VFR	246	G6ZO	243	W6SN	240
WØYXO	246			G6RH	240

RADIOTELEPHONE

PY2CK	231	ZS6BW	210	SM5KP	205
W1FH	224	W1JCX	209	W1MCW	204
VQ4ERR	220	W1NWO	209	W2APU	202
XE1AC	215	W8HGW	205	W9RBI	200

From December 15, 1953, to January 15, 1954, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W2HUQ	231	F9RO	107	HA7O	102
VE2WW	168	F9JZ	106	OH2ZE	102
F9RM	144	W5LCI	105	W3PA	101
W8ZWX	116	ON4TQ	105	W6TMP	101
W7KWO	111	OH3RA	104	W9IOP	101
F3CT	110	W5JSP	104	W2LIU	100
HZ1AB	109	EA3CK	102	W3EQK	100

RADIOTELEPHONE

F8LE	107	W3CGS	102	W3DWA	101
		OH5NW	102		

ENDORSEMENTS

DL7AA	210	I1CJW	142	SM7AKG	122
W1HA	190	HB9AO	140	W1FTJ	120
CM9AA	176	KV4BB	140	W9JIP	120
W7GBW	170	W9FDX	135	W0ENN	120
OK1MB	151	W2ESQ	130	DL3RF	120
PA0RC	151	W3AXT	130	W2ROM	118
PY2AJ	151	G3EMD	130	W8HRC	111
PY1ADA	150	VE2WA	123	W2HSZ	110
PY4RJ	147			W7CSW	110

RADIOTELEPHONE

W1LMB	171	PY4VX	140	CO2BL	125
ON4PJ	152	KH6OR	134	KV4BB	122
CN8MM	150	W9FDX	129	PY2CB	121
PY4RJ	147			W3UIP	110

MEET THE SCMs

Harold L. Lucero, W6JDN, SCM of Sacramento Valley, received his first license in 1923 after a three-year interest in amateur radio.

SCM Lucero is active as Official Relay Station, Official 'Phone Station, 'Phone Activities Manager, Emergency Coordinator, and is a member of the Mt. Shasta Amateur Radio Club. He holds several Public Service certifications for his noteworthy work in various storm and flood emergencies and is the possessor of Rag Chewers' Club, Code Proficiency, and Old Timers' Club certificates.

W6JDN's rig, located in the basement, consists of a 32V-2 and a home-built job which runs 400 watts to an 813 from 10 to 80 meters, 'phone and c.w. The receiver is

a 75A-3 and antennas are doublets for each band. W6JDN also is equipped for 75-meter mobile operation.

Harold enjoys bird raising, and has another rather unusual but very satisfying hobby — raising other people's children. During the past twenty years he and his XYL have given a home to sixteen children who otherwise would have been neglected; at the present time four youngsters are being given "their chance in life."

Harold's favorite sports are boxing and football and he actively participates in fishing, hunting, and skiing. The latter is a "must" during the winter in his capacity as a line foreman for the California Oregon Power Company.

CQ YL! CQ OM!

YLs, OMs, stop look and listen! The 1954 YL-OM Contest is to be held this month. Full information in "YL News and Views" this issue.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.	*'PHONE*
3550 kc. 14,050 kc.	3875 kc. 14,225 kc.
7100 kc. 21,050 kc.	7250 kc. 21,400 kc.
28,100 kc.	29,640 kc.

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *'phone* — 3765, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCY

3620 kc.

TRAFFIC TOPICS

The old saw that nothing succeeds like success is a good one, and it is certainly true of traffic nets. A net with a manager who is popular, energetic, and has organizational talents will find traffic amateurs beating a path to it, frequency. If that leader is not also wise enough to dedicate his net to a specific purpose, and tactful enough to stick to that purpose without offending anyone, he will soon find it spreading, sprawling, becoming as much as or more of a social net than a traffic net — and although by dint of long, patient hours and hard work much traffic might be handled, the net will be a giant, slobbering colossus, good-naturedly accepting whatever and whoever comes along with whatever traffic they have on a "we'll-clear-it-somehow" basis.

Fraternalism is decidedly a factor to deal with in our traffic organization, but we think that its place is secondary to the rendition of a systematic service. No fraternalism is so strong as that engendered by a group of operators who are proud of themselves and proud of each other. There *is* danger of overdoing it, as experience has indicated, but perhaps the fraternal aspect could receive a bit more implementation in some of our more straight-laced traffic networks. How should we do it? We hate to sacrifice net operating time to such a purpose, but perhaps we're more stick-in-the-mud-ish than most. Our ideas would run along lines of a week-end rag-chew get-together on the net frequency, or more frequent net bulletin publication containing personal items; in other words, something outside and entirely separate from the actual net function. Some nets find it possible to have get-togethers in person once or twice a year — picnics, dinners, or even hamfests.

Even net-frequency rag chews are all right before or after QND, and such pleasantries as "good evening" and use of an occasional nickname or facetious remark (if traffic is not heavy) help give a slightly informal flavor to what *could* be a very formal business. But we still stick with the principle that time is of the essence; when traffic is heavy and there is work to be done we should get on with 't and be ready to drop *all* informality if it will speed up the handling of traffic. Or are we being stuffy?

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Apologies. The Early Bird Transcontinental Net reported 902 messages handled in November, an average of 30 per day with more than 40 stations participating. Somehow, we overlooked this in February *QST*.

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TCPN reports 67 stations handling 3206 messages in December. The North Texas-Oklahoma Traffic Net handled 518 messages in December, with 890 stations reporting in.

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National Traffic System. To adapt a phrase from Mark Twain, a lot of traffic men are complaining about conditions, but few of them are doing anything about them. The adaptation is necessary because some of the NTS nets *are* doing something about them. Some of the section nets have moved their early-evening nets earlier in order to get the traffic handled before rigor mortis of the ether sets in; and some of them are holding their "late" nets early in the morning, finding 2200 impracticable under present conditions. Some of the regional nets also have altered schedules.

All this, of course, comes under the heading of taking liberties with the NTS structure, and many operators think that the Great White Father in Hartford frowns on this. But it ain't necessarily so. If you can't get through, there is sense to operating at a time when you *can* get through — as a temporary expedient, with the intention to return to normal schedule if or when we get "normal" conditions back again. Just don't forget that a section net is a section net, a regional net is a regional net, etc., and don't get too far off the beaten track or you'll get lost. As a temporary expedient, we visualize the possibility of a schedule like this being set up: Section net meets first at 1830; regional net meets at 1915; area net meets at 2030; "late" regional net meets at 0700 (or earlier, if possible) next morning; "late" section net meets at 0730 (or also earlier if time of "late" regional net makes this practical). Either something like that, or keep right on struggling with conditions.

The area net, of course, will continue to have a rough time of it at 2030, but since distances to be covered are generally greater its difficulties are not so acute.

One plea for caution: Let's not allow any such temporary changes to ball up our system. And let's get back to the regular schedules as soon as we can.

December reports:

Net	Sessions	Traffic	Rate	Average	Most Consistent
1RN	20	278	.45	13.9	W. Mass.
3RN	16	115		7.2	E. Pa.
2RN	46	228		5	NJN
4RN	48	530		11	S. C., E. Fla.
RN5 (Nov.)	24	165		7	
RN6	47	764		16	BAN
8RN	19	120		6.3	Ohio
9RN (TLI)	28	3739	.84	133.5	Ind., Ky.
TEN	43	2635		61.2	Nebr.
TRN	48	138	.40	2.1	OSN
EAN	24	877		36.5	1RN,4RN,8RN
CAN	20*	885		44.2	
PAN	23	1717		74.6	All
LSN (Los A.)	27	204		7.6	
Minn. Fone	46	258		5.6	
QIN (Ind.)	40**	1031	.54	25.7	
QKS (Kans.)	23	169		7.3	
NYC-LI	18	90		5	
WVN (W.Va.)	22	129	.21	5.8	
WSN (Wash.)	23	357		15.5	
Minn. C.W.	26	118		4.5	
TLCN (Ia.)	23	541		23.5	
Total	607	14,833	.84	23.5	
Record	678	14,833	.84	28.6	

* Out of 22 sessions scheduled.
** Out of 50 sessions scheduled.

What does "rate" mean? That's the rate at which traffic was handled during that session in the month when the greatest amount of traffic was handled — calculated on a "messages per minute" basis. For standards in counting net traffic handled, see March, 1953, *QST*, page 68. To report "rate" we need to know how much traffic was handled in the "high traffic" session, and how long it lasted.

W4AKC has returned to active managership of 4RN; thanks to W4ANK for keeping the ball rolling during Joe's absence. W6IPW says it's time we made another change of managers on RN6. VE3BUR reports better participation by VE1 in TRN — but still all by one man, VE1OM. VE2DR and W8EYO have been awarded EAN certificates; they're not easy to get. W9JUJ would like to see a "separate" 9RN started; W4OGG has received a CAN certificate. W7NH says that all in PAN deserve a lot of credit for their patience and perseverence through the worst conditions possible.

W1TBS and W6WOC are the latest additions to the TCC roster. The Assistant TCC Managers have been designated "Area TCC Directors"; they are, for EAN, CAN and PAN respectively, W8UPB, W9JUJ and W6JZ. TCC vacancies? Yes, there still are some — if you hurry.

W1AW OPERATING NOTE

A detailed schedule of W1AW operations appeared on page 59 of February *QST*. See that issue for full information on when and where to contact ARRL Headquarters Station.

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listings on page 70, November *QST*, and page 67, January *QST*. Please inform us promptly of any errors or omissions so that they can be included in the final May *QST* installment. A copy of the cross-indexed Net Directory is available to anyone on request.

An asterisk (*) indicates correction from previous listing in November or January *QST*. This listing brings the record up to date as far as January 21, 1954. Any registrations received after this date will appear in the May *QST* listing.

Name of Net	Freq.	Time	Days
American Legion Amateur Radio Net (Cal.)*	3975	1900 PST	Daily
Azalea Emergency Net (Ala.)	29,680	2100 CST	Sun.
Bay Area Net (Cal.)	3635	2015 PST	Mon.-Fri.
Black Hawk Co. Emerg. Net (Ia.)	29,600	1400 CST	Sun.
		0730 CST	Mon.-Sat.
Bloomfield Communications Group (N. J.)*	29,520 145,320	1100 EST	Sun.
Broadcast Operators Net	7090	1100 EST	Sun.
Central Teen-Age Net	3510	1830 EST	Daily
Colo. Emerg. Phone Net	3890	0830 MST	Sun.
		1700 MST	Tue., Thu.
The Corn Crackers Net (Ky.)	3945	0800 EST	Daily
Early Bird Transcontinental Net*	3845	0300 CST	Daily
Eastern Pa. CD Net	3915	0830 EST	Sun.
Eastern Shuttle Net	7120	1030 EST	Daily
Egyptian-St. Louis Net	7005	1000 CST	Sun.
	29,640	0800 CST	Daily
FISH Net (Cal.)	3925	1900 PST	Daily
Forest Hill Amateur Radio Club (Ont.)	3735	1900 EST	Sun., Mon., Wed., Fri., Sat.
Golden Empire Emerg. Net (Cal.)	1920	2000 PST	Mon.
Goose River Net (N. Dak.)	1980	0900 CST	Sun.
Grand Rapids Emerg. Net	28,620	2030 EST	Mon.
Green Mountain Net (Vt.)	3860	1200 EST	Mon.-Fri.
Hobo Net	3570	1915 PST	Daily
Indiana Phone Net*	3910	1800 CST	Mon.-Fri.
		0900 CST	Daily
Interstate 'Phone Net	3980	1500 EST	Mon.-Sat.
Iowa Tall Corn Net*	3560	1830 CST	Mon.-Fri.
Jefferson Parish Civil Defense Net (La.)	29,100	1900 CST	Wed.
Kent Emerg. Group (Mich.)	146,160	2000 EST	Mon.
Ky. Phone Net	3945	1930 EST	Mon.-Fri.
McGoon Twin Sixteen Non-Traffic Net (Cal.)	3885	1600 PST	Daily
Memphis Ten Meter Mobile Emerg. Net*	29,627	1900 CST	Mon., Fri.
Mesabi Range Net (Minn.)	1895	1900 CST	Mon., Fri.
Midwest College Net	3895	1000 EST	Sat.
Nassau Co. 10 Meter Net (N. Y.)	28,680 28,720	2000 EST	Thu.
Night Owl Net (N. J.)	29,000	2300 EST	Sat.
No. Dak. CW Net	3690	1830 CST	Mon., Wed., Fri.
No. Dak. Phone Net	3845	1800 CST	Mon.-Fri.
N. J. Mobile Radio Club	29,532	1930 EST	2/4 Mon.
Ontario Forty Meter Net	7160	1930 EST	Daily
Oswego Co. CD Net (N. Y.)	145,000	2130 EST	Sat.
Oswego Co. Emerg. Phone & Traffic Net (N. Y.)	3965	1000 EST	Sun.
Ottawa Six Meter Emerg. Net	50,400	2100 EST	Tue.
Oxford Co. (Me.) Communications System	29,500	2000 EST	Daily
		0645 EST	Mon.-Sat.
Ozark Net (Ark.)	3695	1900 CST	Mon.-Fri.
Par-Troy Emerg. Net (N. J.)	146,880	2000 EST	1st Wed.
Province of Quebec Net*	3670	1915 EST	Daily
Queen City Emerg. Net (Ohio)	29,600	2000 EST	Mon.
R. I. CD Emerg. Net	3993	1000 EST	Sun.
San Francisco Section Net	145,350	2000 PST	Mon.
Seventh Regional Net	3575	1945 PST 2130 PST	Mon.-Sat.
Show-Me Net (Mo.)	7162	1600 CST	Sun.
Teen-Age Net	7175	1245 EST	Sat.
Teen Age Phone Net	3825	1000 EST	Sat.
Third Regional Net*	3590	1830 EST 1945 EST	Mon.-Fri.
Toronto Ten Meter Net	28,250	0930 EST	Sun.
Trunk Line I	3690	2030 MST	Mon.-Fri.
Twin City Emerg. Net (Ill.)	29,640	2100 CST	Tue., Thu.

(Continued on following page)

U.P. Emerg. Net (Mich.)	3930	1900 EST	Sun.
U. S. Coast Guard Auxiliary Net (2nd Dist.)	3865	2215 CST	1/3 Thu.
Va. Overflow Net*	1820	1900 EST	Mon.-Fri.
West Va. Phone Net	3890	1830 EST	Mon.-Fri.
Western Pa. Emerg. Net	29,425	2130 EST	Wed.
		1100 EST	Sat.
Whiteside VHF Radio Net (Ill.)	145,206	2000 CST	Tue.
Wyo. Pony Express Net	3920	0900 MST	Sun.
YLRL Net	3610	2000 CST	Thu.
	3900	1500 PST	Mon.
		0930 EST	Wed.
		0800 EST	Wed.
		0700 EST	Wed.
	3915	0900 PST	Wed.
	7034	1330 PST	Tue.
	14,240	1100 PST	Thu.

FILM LIBRARY ADDITIONS

Two more additions to the ARRL Training-Aids Library are now available to affiliated clubs, on appropriate advance booking. The new films are "Ohm's Law" (F-29), 19 minutes, and "Principles of Gas-Filled Tubes" (F-30), 15 minutes. The former film is ideally suited for any beginner's theory training while F-30 will be of special interest to the amateur possessing an understanding of vacuum-tube principles and terminology. Affiliated-club officers are invited to request an up-to-date listing of other training aids available.

BRIEF

In the 1953 Field Day results (Dec. *QST*), WØBJT/Ø, the Northwest St. Louis Amateur Radio Club, should have been listed in Class 1A rather than Class 5A in the score tabulations. Likewise, W3EDU/3, operated by the York Amateur Radio Club, should have appeared in Class 1A instead of 2A. Sorry, fellows!

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for December traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KG6FAA	1019	8153	7819	334	17,325
WØHKE	984	6838	7760	62	15,644
W2BTB	101	8421	2631	229	11,682
W3CUL	761	5331	3678	1622	11,392
KA7LJ	2318	3843	3558	285	10,004
W6IAB	102	4546	3226	1320	9194
W6KYV	184	2533	692	1251	4660
W9JUJ	42	2239	2020	134	4435
W4PJU	21	1742	1401	341	3505
K4WAR	2309	587	468	121	3485
W2ZOL	39	2143	902	44	3128
W5MN	63	1540	925	598	3126
W4YIP	50	1525	1355	169	3099
KG6FAD	502	1253	1202	51	3008
WØSCA	6	1374	1331	12	2723
W4USA	253	1097	980	113	2443
WØBDR	17	1175	1161	4	2357
W4PL	15	1149	931	183	2278
KA7RC	214	1012	962	50	2238
KH6AJF	535	845	779	45	2204
W1CRW	219	981	939	38	2177
KA3AC	554	732	450	282	2018
KA7SL	1550	190	25	165	1930
KH6FAA	107	931	768	106	1912
W9VBZ	262	820	601	219	1902
W7BA	19	916	888	25	1848
K7FAE	28	778	707	99	1612
W8ZGT	184	724	608	15	1531
W1OGG	16	738	672	57	1483
W3WIQ	23	714	706	36	1479
W3CVE	315	151	967	41	1474
W6ELQ	22	663	575	102	1362
WØKHQ	7	660	648	7	1322
WØCPI	14	632	569	63	1278
K2NAO	20	608	571	37	1236
W9NZZ	316	421	1	418	1156
K5FEF	365	377	335	42	1119
K6FDG	296	400	317	72	1085
W2RUF	114	471	361	113	1059
WØRDN	46	486	477	6	1015
W9TT	22	484	399	33	938
W8AUJ	10	446	344	78	878
W2JOA	115	397	296	65	873
W9UNJ	45	429	277	99	850
KØFCR	322	247	265	16	850
WØOHJ	24	398	385	13	820
W1EMG	3	403	253	150	809
W9OIN	25	413	93	270	801
W8RJC	11	393	300	90	794
W8FYO	6	397	296	86	785
K4WBP	49	365	345	20	779
W2VNJ	18	378	251	116	763
W7PGY	14	367	344	23	748
WØTKX	12	366	272	71	721
W5NG	46	320	310	35	711
W6SWP	16	350	306	30	702
W2CQB	16	334	322	26	698
W3BFF	9	339	324	15	687
W6WGO	609	35	31	4	679
W6IPW	11	338	310	15	674
WØQXO	19	328	228	98	673
W6HLZ	12	328	314	14	668
W4UHA	9	214	424	8	655
W6QJH	12	321	301	20	654
W4PZT	3	316	297	19	635
W1SJO	3	311	263	36	613
W6IZG	24	282	254	50	610
W1RNA	27	300	278	4	609
WØBLI	18	298	250	43	609
W2IVU	60	282	192	71	605
W2KEB	18	276	231	45	570
WØGAR	22	254	269	7	552
W9JBQ	36	268	221	22	547
W8NUL	15	255	269	4	543
W7FRU	2	268	221	47	538
WØHFY	14	259	241	22	536
K5FFB	34	233	238	28	533
VO6U	123	204	34	170	531
K2BSD	32	247	216	31	526
W1TY	3	271	138	106	518
W5UVC	11	241	236	16	504
W1UKR	12	245	206	40	503
Late Reports:					
W6IAB (Oct.)	86	1665	1669	57	3477
WØTQD (Sept.)	7	1722	1717	5	3451
WØTQD (Nov.)	7	1646	1640	6	3299
WØTQD (Oct.)	6	1433	1425	8	2872
K6FCY (Nov.)	30	562	539	23	1154
KG6FAD (Oct.)	74	524	500	34	1132
KA2HQ (Nov.)	197	372	281	67	917
W4PL (Nov.)	10	309	217	72	608

BPL for 100 more *originations-plus-deliveries:*

KØFAM	257	WØFLN	113	W2EC	103
W9CSW	178	W6PHT	112	K9FCA	103
W2NJL	154	W4FOE	134	VE1FQ	103
W2AEE	150	W1FZ	133	W1AW	102
W6BHG	146	VE2CA	123	W9USA	102
W8NOH	143	W4DRD	118	W4DVR	100
KF3AB	141	WØNIY	118		
KA2KS	139	W6HC	117		
WØIJS	138	W6LYG	114	Late Report:	
W1TBS	135	K2BWP	104	KV4BD (Nov.)	120

The BPL is open to all operators who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, W. H. Wiand W3BIP — SEC: IGW, RM: AXA, PAM: PYE, E. Pa. Nets: 3610, 3850 kc. PDJ has published a fine memorial folder on the late Henry M. Martin, PSH. Copies may be had by contacting either PDJ or QV. The Abington Township ARA elected the following new officers to serve during 1954: OSE, pres.; RFI, vice-pres.; PDJ, secy.; RCE, treas. Two new members also were admitted. QLI and WGG. QLZ reports the South Philadelphia Amateur Radio Klub (SPARK) already is preparing its gear for the '54 Field Day tests. New officers of the Pottstown ARA are HOG, pres.; JKC, vice-pres.; WN3YDY, secy.; MXU, treas.; ARK, act. mgr. RCE is moving to a new QTH at Warrington, Pa. We wish to welcome WGG to the General Class rank and the multitude of 10-meter mobilers. OQG now is stationed near Seoul, Korea. Al says he can hear Stateside signals on 7 and 14 Mc. from time to time but he makes no mention of logging any from Eastern Pennsylvania. UQL, one of our more active OES, is running an 832A on 435 Mc. with a sixteen-element horizontal beam. Bill's goal is to span the 85-mile distance between York and the Philadelphia Area on this frequency. If you are interested in this band, get in touch with UQL. After many years of inactivity, GIY again is on the air with a brand-new Viking II and an HQ-140. IGW requests that all EC's who have not yet reported the information requested kindly do so as soon as possible. Your cooperation is necessary to bring the SEC's file up to date. Traffic: (Dec.) W3CTL 11,392, BFE 687, GES 116, AEQ 111, PDJ 98, ONA 90, NOK 85, PYE 80, AD 70, BIP 40, TSY 39, AXA 38, KAG 37, TEJ 30, DUT 24, RSC 20, UOE 20, QLZ 17, PVY 15, OZV 6. (Nov.) W3ELI 28.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — BM, of Ocean City, is on the verge of installing a 100-watt VFO rig in his new Olds '88' and a 100-watt crystal-controlled rig in his Buick. The CARC held its 5th birthday meeting Dec. 14th at the American Legion Hall, Towson, Md., and celebrated with a talk by NVL, of Bendix Corporation, on Negative Feedback. MKM, chief engineer of WBMD and vice-president of WTTR, gave a very interesting talk at BARCS recently entitled "Birth of a Broadcast Station." H has completed a 300-watt TVI-proof rig using 813s. Baltimore City College hopes to be on soon with a kw. through CDB. AYS finally has gone on 'phone. At the Dec. 21st meeting of the BARCS a talk and demonstration on hi-fi was given by A. Trammell of the Institute of Cooperative Research, Johns Hopkins Univ. It is reported that the following have been getting away with quite a few QRM-free ragchews on 160-meter 'phone: RMD, NST, WCH, CJT, SDT, GBB, QND, PSP, NFU, and HDV. QND has been heard recently firing up on 21 Mc. QQS, a new ORS, would like 80-meter traffic skeds into D. C. CQQ took part in the YLRL Party. QZC has wired his entire house so that any record player, radio, or TV set may be heard on any one speaker in the house or on all at once. He also can listen to hi-fi music and monitor 80-meter c.w. at the same time. EEB reports only 79 confirmations out of 110 worked for DXCC. LDD reports increasing activity every Mon. at 8:00 P.M. on 29,590 kc. with about a dozen stations taking part last time out in the Harford County Mobile Net. All Baltimore hams are mourning the passing of FT on Dec. 17th. Sam was one of the finest, most helpful, and most considerate fellows ever to throw a switch. VAR will be heard from soon in MDD, MEPN, 3RN, and MDD Nets. EQK recently received a letter from Miss Verona Firus, 48 Tsimiski Street, Salonica, Greece, who says, "I have found your address and I am writing to you this letter — I would like to send you some nice Greek handmade work and in exchange I'll appreciate anything you would like to send me from America." I'm wondering if the address may have been found in a call book or *QST* or the like and also if any other hams have received like letters. This may be some sort of a racket, fellows, so be on your toes! By the time this gets into print EQK will have given his Web-Wip Bandspanner mobile antenna a good workout. Many of the mobilers are using a new type battery in their cars called Span-O-Life, which seems to be phenomenal. It is unconditionally guaranteed for the life of the car and will be replaced free of charge if anything goes wrong. JE is new EC for the State of Maryland and Asst. SEC. SPL is new EC for the State of Delaware and Asst. SEC. PMQ has been appointed EC for Allegany County, Md. OSE would like to hear from those interested in a Md.-Del.-D. C. QSO Contest to run from Jan. '54 to Jan. '55. WSE is the recipient of a Section Net certificate for his keen interest and activity in the Teen-Age Net (TAN). LSX again is going on 40 meters after a vacation in Nebraska and Colorado. OUX has quit building. UUE will contribute to QRM on 10 meters since finding his modulator trouble. UAE is getting good DX results on 20 meters. HKS is using his neighbor's yard to put up a new antenna. Havre de Grace, Md., had a case recently of a "bootlegger" using the call W3WSL! F.C.C. moved in, however, and took charge! There are 15 stations in the e.d. set-up for Harford County, representing 8 call areas! PZW now is at Fort Monmouth Radio School. VAM took 5 would-be hams to Washington Dec. 12th to take the exams. ARA members recently toured York, Pa., TV stations. Anyone interested in communication filters (125 db attenuation), contact PZ. Traffic: (Dec.) W3CVE 1474, PZW 468, ONB 152, CQS 58, FPQ 40, WV 20, PKC 16, HKS 7, LVJ 3, OYX 3, EEB 2. (Nov.) W3ONB 41, FWP 32, WSE 15, RMD 8, AYS 2. (Oct.) W3WSE 69.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: UCV, PAM: ZI, 3YA. Director of the Atlantic Division, has appointed ZI and your SCM as Assistant Directors to aid him in the normal routine of the administration of the division. Thanks again to ORA for a swell report of his activities, also those of the 6-meter net. This group, which includes BAY and ADA, are very enthusiastic about 6 meters and hope more will join their ranks. BAY is now equipped for all bands 2 to 160 meters. JAG, MM and K2BNC are shipmates aboard the *SS Mercury Sun* and in addition to their regular duties are operating a QRP rig on 40 meters. ZXM, of the *Flying Enterprise*, contacted a few of the locals on 10 meters while docked in Philadelphia. OSD is sporting a new rig on 20 meters. It looks like QBH has interested the whole family in ham radio. Congrats, Paul. LY, LYL, and KN2DMD set up a booth at the Moorestown Friends School Fair which added much to the fair and ham radio. KN2DGQ, KN2DWY, W2CNI, EGP, EWN, LBX, LY, PAC, PTM, PZX, and YBW took part in the Collingswood Civil Defense Test with PTM operating aeronautical mobile. ZI now is communication adviser to State Director of Civil Defense Dreyfus. AXU, formerly QKE, now is Radio Officer for Area 8, Mercer County. So much activity was reported in *Scuttlebut*, the Hamilton Twp. Radio Assn. rag, that we'll have to skip calls and names and just say congrats to the whole gang. Traffic: K2WAO 1,236, W2RG 105, K2BG 66, W2ZI 10.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM, Jeanne Walker, 2BTB. SEC: ETH, RM: RUF, PAM: GSS. NYS nets on 3615 kc. at 7 P.M. and on 3980 kc. at 6 P.M., NYS8 on 3595 kc. at 8 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun. TKO and UYC are trying RTTY on 2 meters. QHH, on 160 meters with 30 watts, worked VP7NM. K2DRY is the XYL of TQ. KAX is the bulletin and information station for TCPN, 2nd call area. RUF, NYS C. W. Net manager, wishes to thank all who QNIed in 1953 for their cooperation and announces the winners of 1953 QNIs as FEB with 199, IFP 195, OE 160, and HKA 153. Santa left Clara a three-element 20-meter Johnson Array. RPO addressed the KBT meeting on Speech Clippers and Filters. KN2PXJ, MSE's brother, is on the air. K2AZA, BZC, W2MSE, and KN2PYA are active in CNYT. ABT's new call in Ohio is 8PNH. Schoharie County ARC officers are BLN, pres.; Geo. Fisher, vice-pres.; NAI, treas.; ISE, secy. The Club call is K2BGQ and meetings are held every other Fri. at 8 P.M. in the e.d. rooms in Schoharie. The Club purchased an HR0.7 and members are active in the e.d. net on 29,550 kc. QXE boosted his antenna to 62 feet. KN2DWZ worked KZ5JH in the Novice QRM. K2DYB worked his 37th state. New antennas used by RDXA were VQM's 80-meter vertical, SAW's ground plane, OTW's "V," and ICE's rhombic. NES is traveling for E&C. MG is back on 75 meters. EHS, a patient in Mount Morris Hospital, works 75 meters. PZ and SSC have 300-watt Elkins. SNI has a new antenna tower at the new QTH. QY have a talk on ham activities in e.d. before a group of industrialists at B. & L. LVE, EB, and VTR are firing up on 2 meters. BTB compiled an instructive booklet with valuable net information for members of TCPN. I wish to congratulate UTH on an EB job as SEC. RARA's Western New York Hamfest will be held

May 15th at the Doud Post, American Legion, on Buffalo Road, Route 33, just west of the city of Rochester. RQF has series cathode modulation. Endorsements: UTH as SEC, RUT as ORS, TIY as EC. Net certificates were issued to DSS and EMW. VDF has been appointed ORS. The Corning Radio Club conducted a hidden transmitter hunt on 10 meters in November. Traffic: (Dec.) W2BTB 11,682, ZOL 3128, RUF 1059, OE 180, K2BZC 154, DYB 143, W2JMT 86, ZRC 86, HKA 80, RCT 80, K2ACA 79, W2IPC 58, MSE 43, DSS 32, SJV 27, QHH 21, RQF 20, K2CTQ 17, W2UYG 15, DVE 10, K2DG 10, W2EMW 8, FEB 8, K2DBB 4. (Nov.) W2MSE 2. (Oct.) W2MSE 8. (Sept.) W2MSE 14.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: CA. RMs: GEG, NUG, UHN. PAMs: LXE, AER. The Radio Association of Erie has received as additional equipment for its emergency trailer some 6-meter walkie-talkie sets and KLD is building a similar set. The truck purchased for hauling gear and towing the emergency trailer is going through overhaul at the hands of STK, OIH, ODF, and RLJ. NXK reports good results using the twin triplex antenna. The Steel City Amateur Radio Club is working at putting KWH on the 75-meter band. VBL's new QTH is Shaler Park. Tony Gessler passed his General Class exam. TOB is working for Magnetics Inc., Butler, Pa. WHY is on 40-meter 'phone. SIQ is SIQ/8 from Capital University in Columbus, Ohio. MPO has a class going for Novices. The Washington County Amateur Radio Club says the county net is going well under the guidance of the NCS IDO. NRE, OEO, and ONX. VFN, on 3.5 Mc., is working ZL, DL, and G DX. TON was home for the holidays. The Western Pennsylvania Amateur Radio Club Council has been holding monthly meetings and since its primary purpose is to bring representatives of organized clubs together to swap ideas and formulate new ideas and activities for the advancement of amateur radio, we suggest that all Western Pennsylvania clubs have their secretaries write for more details on joining the Council. It is made up of delegates from all member clubs and at present is trying to hold meetings in the various member clubs' cities so that the burden of travel will be equalized among delegates. For information write R. M. Heck, Rt. 1, Sharpsville, Pa. I would also appreciate club secretaries dropping me a letter the 1st of each month on activities in their area for use in this column. Traffic: (Dec.) W3WBQ 1479, QPQ 381, NRE 268, UHN 57, YA 57, NUG 51, KUN 39, SIJ 22, LSS 10, CA 5, KNQ 4, VKD 4. (Nov.) W3NUG 23.

CENTRAL DIVISION

ILLINOIS — SCM, George T. Schreiber, W9YIX — Section Nets: IEN (phone) 3940 kc.; ILN (c.w.) 3515 kc. SEC: HOA. Cook County EC: HPG. PAM: UQT. RM: BUK. CTZ sends Official Bulletins for ILN and others at 6:50 P.M. Mon. through Fri. YLC and HKI have new Elmac transceivers. AND has a new Collins 75A-3, and operated as /XE1 in Mexico City. The XYL of IVU gave a birthday party for IVU, JSP, and AND, with PCY, HKI, and FVI, present with the ladies. AWA and FUR experiment with a ground plane and vertical, respectively. SM5LK has a new house and has to wait two more years to get his W9 call. The Whiteside VHF Net Club has an assembly line project of fifteen 2-meter transmitters and receivers for its members in a defense project. DEH moved from Dixon to Chicago. MBI moved to Palmetto, Fla. ZEN puts out an interesting bulletin for the Starved Rock Club. The Chicago Suburban Radio Assn. has planned meetings with instructive speakers. The Club elected DWD chairman of contest activities and PBJ as Field Day chairman. GPV, EC, acts as Net Control for the West Suburban Emergency Net (29.640 Mc.) each Tue. at 8 P.M. New hams in Illinois are BRH, CRI, and WN9BII. DPY is the father of a new YL, Susan. The XYL of OAL put a padlock on the shack door and refused him the key until he did a specified list of chores. KHJ writes he wants to rent an outside billboard to display his QSLs obtained with 40 watts. NN got the Bronx cheer from two neighboring children. When he asked for an explanation he was told "you spoil Howdy Doody." He bought the kids a hi-pass for Christmas. The St. Clair Amateur Radio Club visited WTVI-TV at Belleville to see where the stuff starts. K9FCA, at Scott AFB, checks into ten nets daily and operates on a 24-hour basis. AMF has a 20-meter beam with center-loaded elements and reports excellent results. KCV has gone mobile. Two sixes, PMD/9 and YWQ/9, are attending communications officers school at Scott. BA renewed his EC appointment. What is the date on your appointment certificate? PHE reports his son, JVI, has returned to Stateside after duty tours in the Arctic, Germany, and Korea and plans to return to the air in the spring of 1954. HOA, the EC, puts out a sparkling bulletin called *Coördinattons* from his Rockford QTH. VTL is his assistant. LC, a major in CAP, recently coördinated c.d. maneuvers on North Shore. MTQ QRMs CQG across the street but they still speak. PEB and NVZ both have new mobile rigs. EWR came back on the air with a kw. ATH is happy about solving his TVI trouble on channel 2. CKU has given up c.w. and says he is learning the phonetic alphabet. New officers of the Illinois Ham Club are FKC, pres.; and ABA, secy.-treas. To those of you who wrote, thanks. The mail was exceptionally heavy but we'll get around to answering it. Traffic: W9OIN 801, CSW 381, USA 306, OKQ 278, IDA 240, K9FCA 206, W9STZ 178, CTZ 176, YIX 169, FRP 52, SME 47, W6CTW/9 36, W9BUK 30, AND 26, LMC 19, MRQ 11, BA 2.

INDIANA — SCM, George H. Graue, W9BKJ — YWE reports the total traffic for QIN as 607. NTA reports a traffic total of 314 for IFN. Newly-elected officers of the New Castle Radio Assn. are SQW, pres.; PPD, vice-pres.; HKM, secy.-treas. PPD now is on 147.3 Mc. and monitors the frequency 24 hours a day. NDH is new marker frequency station for IFN. GDY is 75-meter mobile now. NCARA was host to the Tri-City Radio Club. The attendance at the Michiana Radio Club annual banquet was 115. MAM has a 75-ft. pole in the alley and no place to erect it. Ex-SCM RE is ill again with a bad ticker. HQF attended the DXCC meeting in Chicago. FVI is a civilian again and will be on 80-meter c.w. The TARS hopes to have a new meeting place. The Club procured a 3-kw. gas-driven generator. It's truly a warm signal that comes from BRR. The Mobile Amateur Radio Club of South Bend sponsored a Christmas party for members and their families. Our ex-SCM, DGA, is trying his hand at a new hobby, oil painting. DKR has a new modulator. CUT is a new Novice in Kokomo. PUK graduated from Tech. Class. RZS hopes to have his frequency meter in better trim for the next frequency check test. PUB claims he is knocking them dead with a Six-Shooter antenna. ANJ is using a 400-ft. long-wire antenna. Santa left AJA a Viking. IFN and INU were home for the Holidays. QR installed a low-pass filter. Newly-elected officers of the Lake Co. Radio Club are GUX, pres.; PAS, vice-pres.; KRJ, secy., and MIF, treas. The DARA code class helped produce WN9CVD, SCZ, CTL, CPQ, and CUC. ØIZA/9 is new president of the DARA. VNV is vacationing in Mexico. OWZ finds time to work DX along with net activity. LDL has changed mobile rigs for 12-volt battery. JUJ has 147.3-Mc. mobile along with the same as a fixed station. MUR has 100 watts on 147.3 Mc. Trophies were won by SWM and JVN during the recent SS and presented by the Martinsville Radio Club. The FWRC held its 32nd annual banquet Jan. 16th. The Lake Co. Amateur Radio Club held its banquet Feb. 13th. Many Indiana hams will be sporting call letter license plates soon; over 900 have applied so far. Traffic: W9JUJ 4435, NZZ 1156, TT 938, JBQ 547, NTB 226, STC 166, QYQ 158, YWE 119, UQP 113, VNV 111, STC 109, WBA 70, FYM 67, DOK 56, PPS 45, OWZ 42, SWM 42, AB 38, KDV 34, BDP 18, PPS 17, SWH 17, GUX 9, IFR 8, NTR 6, YVS 6, QR 5, NH 3.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RMs: MQV, UNJ. Nets: WIN 3625 kc. at 6 P.M. daily; BEN on 3950 kc. at 6 P.M. daily. State mobile and c.d. frequency: 29.620 kc. ILR received 1st-class radiotelephone ticket. Santa presented CXY with a new DB-23 preselector and Dynamic Hi-Fi headphones. LSK now is on s.s.b. with 10A exciter and a pair of 807s in home-built final. RTP is trying out Lysco 381 VFO. KXA, who has been operating 3PQT at NATC, was home on leave and visited with his dad, KWJ. VKR replaced mod. transformer and is back on 'phone. NTD is working the BEN regularly. UMJ is having good luck with T2FD antenna. QYH has a new HQ-140 receiver. WWJ is active from Menomonie. VBZ was high 'phone scorer and GIL high c.w. scorer for the MRAC in the SS. GDW, LEE, and FZC have new Viking II rigs. WN9YAF is now at Shawano. WN9VAK dropped the "N" and is now at U. of Wis. PFK scored in the recent F.M.T. with an average error of only .00002 per cent. VCH built an all-band converter for his BC-454. ZCK built a five-band c.w. rig using the bandbox and a 2E26 final. The Milw. School of Eng. Club is sponsoring a small equipment construction contest. LEE is running 250 watts to new p.p. 4-125A final on 144 Mc. FHU is on 2 meters after a long absence. JZS has migrated to 160 meters. DSP is on at the new QTH with 24-element beam on 144 Mc. and three-element 21-Mc. beam and is working on a new rig with VT-127As. RKP needs one more card for DXCC out of the 112 countries he has worked. GFL has new 80-ft. steel tower with prop-pitch motor for rotator. December EC reports were received from AKY, GMY, KCL, NLH, and RUF, according to the SEC, OVO. UTN works all bands with Viking II and S-76 receiver. Mark your calendar now for the WVRA Hamfest at Wausau May 8th. Traffic: W9VBZ 1902, UNJ 850, SAA 297, CXY 289, MQV 115, LSK 70, GMY 54, IQW 53, RTP 46, CFP 35, LUE 24, KWJ 19, VKR 17, NAJ 13, RQM 12, HDV 5.

DAKOTA DIVISION

NORTH DAKOTA — Acting SCM, Earl Kirkeby, WØHNV — The Sioux Amateur Radio Assn. is well on the way with plans for the 1954 North Dakota Hamboree. Prexy GZD reports many fine prizes already are lined up. PHH has added his car to the growing line of 160-meter mobiles. LWX is vacationing in California. BIH is on all bands with a new Viking II. The North Dakota 75-meter 'Phone Net meets every night at 1830 CST on 3845 kc. except Sun. How about checking in? The NCS, OEL, reports more than 35 active members reporting to the Goose River 160-meter Emergency 'Phone Net drill every Sun. at 0900 on 1980 kc. Traffic: WØEXO 52, FVG 25, NPO 15, PHH 5.

(*Continued on page 68*)

(Number two hundred thirty-nine of a series)

BACKGROUND NOISE VS. NOISE FIGURE

How OFTEN have you heard the remark that Joe Kalabash's receiver was better than yours because his receiver had a lower noise level? How often have two hams put two competitive receivers side by side, turned the R.F. and Audio gain controls wide open while tuned to background noise and then decided to keep the receiver with the lowest noise level on background noise? They think they have proved that the receiver chosen has the best front end with the lowest noise figure. Actually, they may have chosen a receiver with inadequate gain to hear the really weak signals.

I have often heard the remark that a certain ham had tried the latest model HRO, for example, but had decided to keep his old one because it had "a much lower noise level." This indicates to some a better noise figure. Actually, he's keeping his old one because it doesn't have as much gain as the new one, since the test made has very little to do with front end noise figure. He is probably measuring the receiver's ability to hear antenna noise, and turning down the one that does the best job!

As a matter of fact, the noise figure of the front end of the HRO-60 is about twice as good as the older models, being in the order of 5 db against 10 db for the HRO-5. If it were possible to design a front end that was perfect with a noise figure of 0 db, we would still boost up the gain of the receiver so some noise could be heard with an antenna connected. If we didn't, how could you copy signals that are "down in the noise"?

A receiver that will only hear background noise very weakly (unless it employs a squelch of some kind) is at a distinct disadvantage in copying "the weak ones". If it can't hear the noise, it can't hear the weak signals, or hears them so faintly that it is impossible to copy them. In view of this, you can readily see the fallacy of trying out a receiver on "background" noise alone.

How then do we compare two receivers? Lacking a noise generator actually to measure the noise figures, the best way is to try them out side by side on the same antenna, tuning in weak signals that are down in the noise. Then the adequacy of the receiver gain becomes apparent and the ability to copy weak DX is easily determined.

Many hams have been sold on the HRO-60 over all other receivers after making this test.

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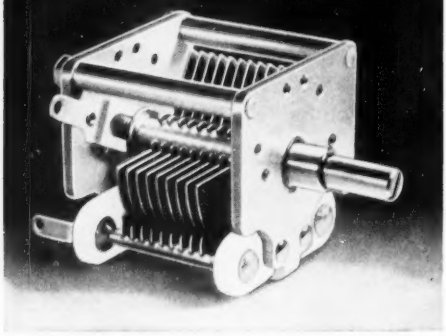

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(Continued from page 66)

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. PAM: UVL. RM: OLB. NJQ died suddenly of a heart attack. He was Net Manager of the South Dakota 75-meter Net. Dakota and Minnesota hams are contributing toward a memorial for Rae. NEO was elected NCS of South Dakota "Nine Jacks and Queens" Net, named in honor of NJQ, and meeting at 1210 CST daily except Sun., 3870 kc. PRL is NCS of the 1830 CST net. YQR's Christmas present was a tape recorder, while XYL Martha received an SX-42. New jr. operators arrived at the homes of GDE and WUC. The Prairie Dog ARC elected as officers ECJ, pres.; GDE, vice-pres.; ZVV, secy.-treas.; MMQ, chief op.; WNØRLA, custodian, and Lester Lauritzen, pub. mgr. The 160-meter 'phone net meets daily at 2000 CST, with 25-30 stations reporting in. FKE is NCS. TNU has a new Viking and VFO. GCP is vacationing in Oregon. LBS worked 5 new countries during the Christmas vacation. I still receive reports too late to be included. I must have them by the sixth of the month and will appreciate your cooperation. Traffic: KØECR 850, WØPHR 314, NEO 143, ZWL 92, SMV 56, YQR 37, GDE 33, LBS 8, AYD 4.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: ZDU. RMs: OMC and DQL. PAMs: JHE and UCV. EPZ now is WØPTB. KFF and EPJ are basking in the sunshine in Florida. Norm is on 20 meters in St. Petersburg. ANU has a new 32V-3. KLG has been helping out as Net Control on the MSN. HFY has an exciter on his rig. K6EA has his receiver trouble fixed. HKF's average error in the E.M.T. was only 4.4 parts per million. RAK is out of the Army. While in the Twin Cities for the holidays IRD attended the Mesabi Club dinner. St. Cloud is reorganizing its Radio Club. New officers of the Minneapolis Radio Club, Inc., are EAL, pres.; DQL, vice-pres.; and HZR, treas. AWD is out of the Service. BUO is building a high-power mobile rig running 100 watts using a vibrator power pack of his own design. Chuck received an HRO-50T for Christmas. CQY is Radio Officer for St. Paul RACES program. DNO acquired an SX-42. EMH is planning high power with a pair of 813s. GGQ has a 75A-2 and is acquiring a 10A s.s.b. exciter and planning a pair of 8QQs as an s.s.b. final. GJZ also is building high power with a pair of 813s. PBL is on 75 meters using a vertical antenna. REA is the new call of the St. Paul Radio Club and is headquarters station for the St. Paul Civil Defense. REA is on Sun., Wed., and Fri. from 1930 to 2130 on 3735 kc., 29.520 kc., and 50.7 Mc. for any calls. URQ rebuilt an AR-88 receiver for REA. The Club members are building pack sets for 6- and 10-meter coverage. REF is building a 40- and 20-meter mobile rig that will be covered with a Vibrapack. EZV is building a 'phone patch. RA is on the air now with a Viking I. Jack also picked up a Hallicrafters HT-6 at the Minneapolis Radio Club Christmas Dinner. HKF is rebuilding his mobile rig. RIL has been heard on 75 meters using s.s.b. If you like to handle traffic, check into the MSN on 3595 kc. at 1830, MJN on 3690 kc., and MSN 'phone on 3820 kc. at 1205 and 1800 CST. Traffic: WØTKX 721, HFY 536, DQL 401, KLG 173, KJZ 160, UCV 147, HUX 114, SWB 110, KNR 87, BZG 78, GGQ 77, KFN 75, CXM 50, BWM 48, EQS 46, GTX 41, MXC 32, TJA 32, BUO 29, IKJ 28, DYD 26, AGD 25, IRJ 24, FFC 19, EMH 18, OMC 17, LUX 12, K6EA 12, WØECR 10, HAH 10, TSN 10, EYT 8, OAZ 6, OPA 6, GWJ 4.

DELTA DIVISION

ARKANSAS — SCM, Fred Ward, W5LUX — Everyone seems pleased with the new license plates that we now have. The large white letters on a green background really stand out. EA has moved to Louisiana for work in the broadcast game. We hope to get him back in Arkansas soon. FMF reports the code class is coming along fine with about twenty members. OEF can use more help with the OZK Net, and MSH needs stations for the Regional Net also. YHC is spending most of his time on 40 meters and reports good conditions. MRD has renewed all his appointments and is SEC again this year. A lot of fellows have let their appointments run out, but if you will send them in we will be glad to renew them for you. CAJ has a new receiver. MRD has a portable generator for emergency work and gave it a good trial during the deer season. Traffic: W5FMF 9, PX 5.

LOUISIANA — SCM, Robert E. Barr, W5GHF — NG makes the BPL listing again with a fine total of 711. TRQ led the State in the last CD Contest, which is a fine showing for Page, who is just a few months out of the WN class. The Greater New Orleans Amateur Radio Club hereafter will issue to any amateur who confirms two-way communication with 25 different stations in the Greater New Orleans Area a very beautiful certificate appropriately called the "WA '25'" award. The Club now boasts a membership of more than 80, and is making a drive to get the majority of the 400-plus operators in the Area as members. The Istrouma Club at Baton Rouge is seeking ARRL affiliation. The B.R. clubs are sponsoring a pair of good city emergency nets, one on 3870 kc., the other on 1885 kc. GXO now is using a 10A s.s.b. exciter and is building a high-power final

(Continued on page 70)

HAMS SAY...

"I hear 'em now!..."

with my HQ-140-X"

"Design Engineer must be a ham."
— **W6JTV**

•

"Truly a Ham's dream."
— **W4VPU**

•

"Very pleased — sharp tuning on CW especially."
— **W1LF**

•

"Excellent noise limiter, no notice of signal loss."
— **W8PMA**

•

"TNX to the person who designed this; Band Spread, Stability, Selectivity all XFB."
— **WØQXP**

•

"Selectivity excellent on 40 meter phone band."
— **W8HUA**

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"I think I have what every ham dreams of, that is a HQ-140-X."
— **KN2EQH**

Here are a few typical comments from the hundreds of HQ-140-X receiver owners. Hams everywhere are enthusiastic about this receiver because they've learned that it's built to Hammarlund professional quality standards. They are finding that the extra care in design, circuitry, and construction, not usually found in an amateur receiver, pays big dividends in —

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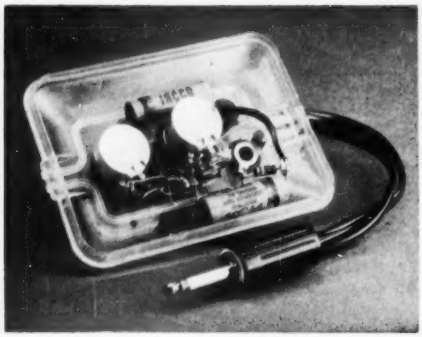
AS SEEN in QST

QRM Filter

June 1953
page 23



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for it. LV and WQP both had 14-Mc. contacts with LU3ZS and V8AK at Antarctica. ABS is one of the pioneers in s.s.b. in New Orleans using parallel 6146s. Loyola University of the South is now teaching code and theory. The New Orleans Club is planning to establish its own blood bank. Traffic: W5NG 711, TRQ 8.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — We hams did a good job during the Vicksburg disaster. I would like a card listing emergency equipment including power supplies from all hams in the State desiring to take part in this type of work. Don't delay. TIR is on 160 meters. 9QOM/5 has a new 85-watt rig (c.w.). WN5CNW has TBS-50. ZPP has mobile rig on all bands. 9YUP/5 has mobile rig on 75 meters. CBW has a new antenna 500 feet up and also a new operating desk! N5CJR is a brand-new ham. MEN had an attendance of 275 during December. The Alternate NCS is WQQ. He's 14! The Net needs outlets in Jackson, Meridian, Hattiesburg, Vicksburg, and Corinth. Please send applications for AREC membership to KHB in Natchez. Appointments are open for you ARRL members. Anyone desiring one, please write. Snow me under, fellows! Traffic: W5KYC 232, RIM 160, JHS 140, TIR 106, K5FBB 105, W5BTM 21, VME 10, AMZ 8, OTD 6, YBH 5.

TENNESSEE — SCM, Mark M.Bowelle, W4CXY/WLG — SEC: NJE, RM: SCF, PAM: QT, C.w. net frequency: 3635 kc. 'Phone net frequency: 3980 kc. The gang took advantage of the holiday season to run up some nice traffic totals, with three stations making BPL. We would like to make it clear that you do not have to send in a huge total to have your report appreciated. Your SCM wants your report, whether it is one or one thousand. YIP made some interesting observations by placing an elapsed timer in his final plate circuit. You will be surprised how much time your rig is on the air during a month. TUP reports two new stations at Mountain City, DFH and WNE. FLW says that the Weakley County RACES plan has, at long last, been approved by all concerned. We reported this plan approved once before but we were premature. HHK still is doing some fine work with his 144-Mc. tests with W2UK. There may be better mobile c.d. nets than the 144-Mc. Memphis Net, but this writer has not seen them. If you are in the Memphis Area and can listen on 145.5 Mc. almost any hour of the day or night, you will see what we mean. Just when we thought we had a fine traffic station moving to our section, 5GOH/4 got his travel orders again. Traffic: (Dec.) W4YIP 3099, PL 2278, OGG 1483, OEZ 389, PFP 261, TYU 149, SCF 123, UWA 85, ZJY 73, IIB 56, WQW 51, SUH 39, WGJ 25, UIO 24, HIH 15, TUO 14, RHO 12, RMJ 12, RET 10, TIE 10, PVD 8, PSN 5. (Nov.) W4PL 608.

GREAT LAKES DIVISION

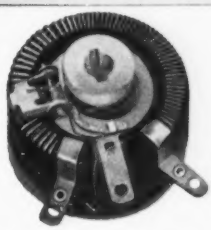
KENTUCKY — SCM, Ivan C. Kelly, W4TUT — WHC is back at Campbell and getting all set to run up some more of those fine traffic reports. WXL is slapping the new Christmas bug and also changed the type of antenna. UWA has returned to college after the holidays. NIZ is busy with new club activities at Owensboro. WNH still is de-clicking his new VFO. Ex-MVL still is in Haiti. ZLK has a new VFO and is working KYN hard. JUI isn't satisfied with 1 part in 10 million frequency checking. WXX is a new AREC member in Paducah. BAZ still is watching over KYN. KFN is fading away into the long skip. Several of the boys are giving 15 meters the eye. This month saw the fewest number of reports ever received from the boys by the SCM. Either there was not much activity or too much Christmas. The fellows must remember that this report depends entirely upon the individual reports of the boys. BAZ changed from a Collins 310-B to a 32V-2. Traffic: W4BAZ 340, WNH 151, SBI 142, ZLK 113, UWA/4 85, WHC 58, WXL 56, YZE 52, NIZ 25, NDY 9, JUI 4.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Robert Cooper, 8AQA; Joseph Beljan, 8SCW; Mickey Wills, 8CPB. SEC: GJH. New appointments: OR3 to SWG, OO (Class I) to CXP. New officers of the Jackson Amateur Radio Assn. are DCF, pres.; BBY, vice-pres.; JKX, secy.; RHB, treas. BPL cards went to four operators this month, the greatest number this SCM has had the pleasure of mailing in any month. It shows a healthy increase in traffic-handling, in spite of very rough band conditions. Top scorer in *deliveries* was RJC, who mourns the lack of Metropolitan Area stations checking into the nets. Herb says he had to mail most of his deliveries. On the other hand, QIX effected delivery on 58 of the 59 messages he received; showing what could happen if more Metropolitan Area stations would check into the nets regularly. Every now and then we hear a few newcomers in the nets; some of them sound rather apologetic, as though they have the impression they are intruding. Believe me, fellows, you are as welcome as a choice piece of real DX! Don't hesitate to check into the net of your choice, and if you are in doubt as to net procedure just drop me a card requesting a copy of Net Operating Procedure. Remember, you can't get your feet wet unless you get in the water! QIX got the 812 final perking; running 175 watts now. MGQ is finishing installation of his 220-volt power line, which will complete his high-power rig. The Genesee County boys are keeping 2 meters active, along with a string of low-powered 160-meter rigs.

(*Continued on page 72*)

MALLORY HAM BULLETIN

ANNOUNCING—
Mallory Type "K" Vitreous Wire-Wound Power Resistors and Potentiometers 25 to 500 Watts



NEWS ITEM: The recent announcement of the availability of Series "K" Mallory Power Rheostats and Potentiometers from your Mallory Distributor marks the first time that Mallory-built controls have appeared in the 25 to 500 watt class.

With years of experience building 2, 4, and 7 watt Mallory wire-wound controls, it was natural that Mallory high wattage controls would contain operating advantages not found in the usual power control. As a matter of fact the features of these controls are so outstanding that we believe you will be interested in hearing about them even though the use of power controls is rather remote from normal amateur activities.

One of the first things you will notice about the Series "K" control is its smoothly operating sliding contact, mounted snugly in its unique, spring-loaded and hinged carrier.

The firm direction of force exerted by this assembly eliminates completely the problem of "rocking" contacts which has plagued power control users for years. The expressly compounded copper-graphite construction of the contact lubricates the resistance element at the same time it lowers the contact resistance between the two parts. A flexible pig-tail connection provides a direct electrical path between the contact and the center collector mechanism.

Perhaps the most outstanding feature of this whole assembly, however, is its construction which allows the contact to be lifted from the resistance element for cleaning purposes without distorting or disturbing the applied force. Incidentally, the contact is almost as easy to replace as the brushes in a small electric motor.

The center collector and shaft assembly is spring-loaded to assure virtually constant electrical conductivity for the life of the control; in addition, all Series "K" controls above 25 watts are equipped with a copper-graphite buffer plate as a part of the collector assembly to reduce erosion as well as assure positive electrical contact. The shaft is centered and insulated from the electrical circuit by means of a high quality steatite bushing.

The body of each Series "K" control is formed from electrical grade porcelain and each turn of the resistance winding is uniformly wound on this form to provide an even progression of resistance change vs. shaft rotation. A non-alkaline, non-hygroscopic enamel is applied carefully to the winding, and then heated to a hard, glass-like finish for maximum protection to the vulnerable parts of the winding.

The smaller sizes, 25 through 150 watt, are equipped with conventional threaded bushings for panel mounting; sizes above 150 watt are equipped with set screws. All sizes have panel locating lugs which may be adjusted for universal mounting. Suitable knob and dial plate are supplied with each.

A brochure containing dimensional drawings of this new control, plus catalog listings, has been prepared and may be had by writing to us at Box 1558, Indianapolis 6, Indiana. Meanwhile, check with your Mallory Distributor, and take a good look at this new power control. Its construction alone will inspire confidence in its ability to operate properly for a long, long time.

We're mighty proud of this control. And we believe justly so!

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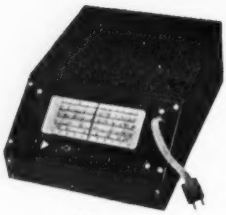

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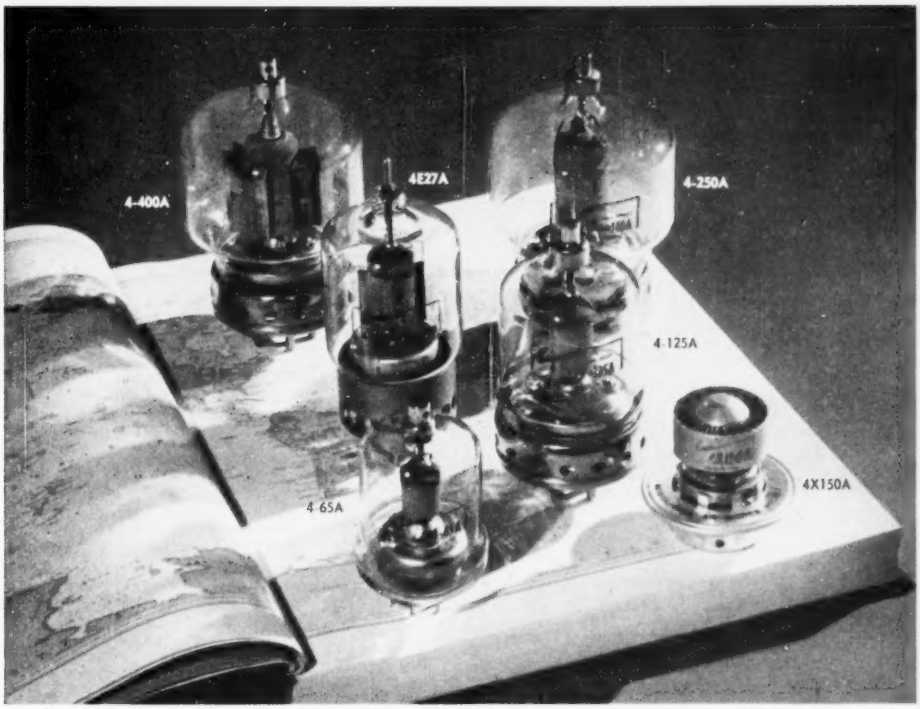
WXO is back on the air to stay (he says!). Among other activities he has built nine Novice transmitters to date. Gossip on your traffic report cards was pretty slim this month. Don't be afraid to "give," fellows; everyone wants to know what is going on. Traffic: (Dec.) W8ZGT 1531, RJC 794, NUL 543, FLM 418, ELW 261, NOH 245, RTN 230, ILP 133, QIX 118, JYJ 107, WXO 90, SCW 81, NEK 58, SJF 58, URM 56, DLZ 49, IV 47, COW 26, SWG 26, MGQ 19, HKT 14, GTM 13, TBP 12, OQH 9, WVL 8, EGI 6, GB 6, YMO 6, HSG 4. (Nov.) W8IKX 50, WXO 10, FGB 9, IBB 9. (Oct.) W8FSZ 36.

OHIO — SCM, John E. Stringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN (phone); J. C. Erickson, 8DAE (c.w.); and W. B. Davis, 8JNF (adm.). SEC: UPB. RMs: DAE and PMJ. PAM: PUN. FYO was the lone BPL this month. It is regrettable that a number of appointments have had to be cancelled because of non-reporting. In order to keep this a good section we must have written reports. An appointee's interest should not end upon receipt of a certificate. OES certificates were issued to LHK and HCD. IFX has initiated an 813 rig using 811s for modulators. PMJ is rebuilding his VFO. JNF has gone s.s.b. GDQ caught up with CN2AO on 160 meters. MGC has obtained a 32V-3. FSM has been bitten by the traffic bug. RO hopes to get a new Globe Scout. From Medina Co. we learn that AQ is nailing considerable DX on 80 meters. EEI is back on c.w., and DCI finally has gotten up his new antenna. TCPN (3970 kc.) needs more Ohioans. Those on the active list are GDB, OAC, SRF, HNP, HUX, AMH, LMB, and K8AIR. CTZ is furthering his education at Ohio State. St. Nick brought DL a Viking II with VFO and Matchbox. DG is trying out 160 meters. OPU is ex-5QOT and his XYL is OPV. YGR writes that the Lucas Co. e.d. director paid HNP, the EC, quite a compliment when he said Bud's boys knew best of any group what they were doing in the S.E.T. Dayton's *RF Carrier* states that the 1954 officers are ZOE, pres.; GQ, vice-pres.; KWS, secy.; and KTM, treas.; YCP apparently is the bulletin's present editor, and about 60 people recently were graduated from the Club's code and theory class. *Ham Flashes*, which covers Eastern Ohio, reports the untimely passing of 9OYB (ex-WWK). AYK has a 32V-2, EK and MWP have acquired Viking IIs, GST has moved from Cleveland to Youngstown, YKU and her OM recently returned from a Western jaunt, BYT has just become a "grampaw," IOO has deserted n.f.m. for a.m., and ACP has completed a 10-meter beam. Carty, our superb SEC, went over with a loud bang in both Painesville and Ashtabula, where he lectured on the AREC and RACES programs. The *F H A R A Bulletin* of Hamilton tells us that MDY, MDZ, and OFK made General Class, UNW will be on 2 meters soon and ODO has acquired a Viking II. GCARA's *Mike and Key* relates that IJR has moved into town, MGP has started general repairs on his station and antenna, and 350 souls attended the TVI demonstration, featuring IICP. The *Q5*, out of Springfield, mentions that WXG is the most active public-spirited member of the Club, LAB has a pair of 813s on the air, the Club held a contest early in the month, and a class for Extra Class aspirants is being considered. *Shack Gossip*, the excellent creation of HUX and HWX of Toledo, informs us the KQNs have a spanking new baby girl. IEP has been released by the 37th Division, MBI and LNV made General Class, DQR and TWD are active on 420 Mc., and OEG worked Virginia with his self-constructed four-watt transmitter. Newly-elected West Park Radiop officials are YPE, pres.; IWP, secy. and treas.; VM and ZEU, trustees. A correction to a correction: It was not HGH who was reported as in Japan but HQH and the latter insists he's in Cincinnati! Another correction: GCA does not commend the HCL (high cost of living), he condemns it, naturally! Traffic: (Dec.) W8EYO 785, UPB 213, YCP 196, LMB 195, DAE 130, IFX 117, AL 102, RO 65, GDB 60, DG 46, CTZ 42, HUX 36, GZ 32, EQN 28, AJW 27, NYY 26, HZJ 24, FSM 22, ARO 20, QIE 18, WJB 18, DL 17, KIH 17, HNP 16, ET 15, ZAU 13, BLS 12, YGR 12, IJH 11, UPI 10, RN 9, GDQ 8, LZE 8, CTO 7, HXB 7, RZ 7, AQ 6, TLW 6, DZO 5, HPP 5, KZM 5, HHF 4, MGC 4, UZJ 3, AYR 2, PIY 2, PMJ 2. (Nov.) W8IIC 70, DL 22, PBX 6, GDQ 4.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI. A hearty welcome to the Harmonie Hill Radio League. After considerable groundwork in Oct. 1952, it was finally organized in April of 1953 with a membership of ten. At this writing, its members number forty and it is affiliated with ARRL. It is located at Mt. Kisco and meets the first Fri. of each month. New officers are PCP, pres.; W. R. Lindsay, act. mgr.; D. Cristofaro, secy.-treas.; AWQ, trustee. Section Net certificates were awarded to K2BE, K2EOQ, and EQD for activity on NYS. PHO, who is very busy these days, sends his regards to the gang. K2ARO is on 220 Mc. with 4 watts and a five-element Yagi. He would like to hear from the boys working the band. The new manager of MHT (3617 kc.) is KN2GAU; his assistant is KN2EKS. The SLRC has acquired larger quarters at the Borough Hall in Upper Saddle River, N. J. ZTZ, the Club's activity manager, is the new Spring Valley EC. New officers of the SARA are: UKL, pres.; YIV, vice-pres.; ZBY, secy.; FW,

(Continued on page 74)



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4-250A	50mc	3.2w	2.6w	675w	1000w
4-400A	50mc	3.5w	6.1w	825w	1000w
4X150A	420mc	2.0w	1.2w	200w	250w
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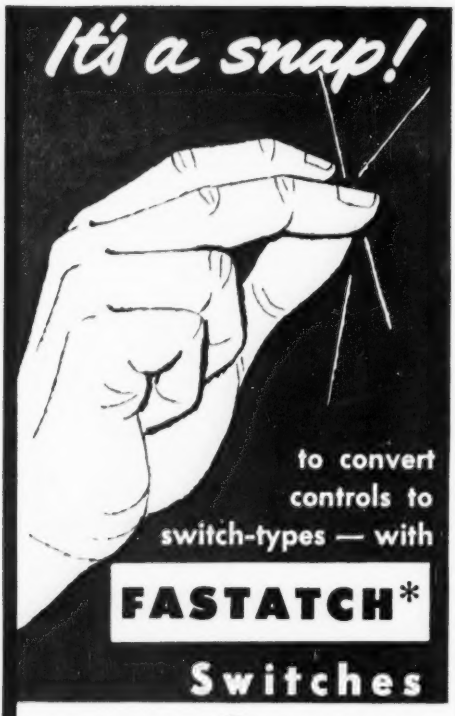

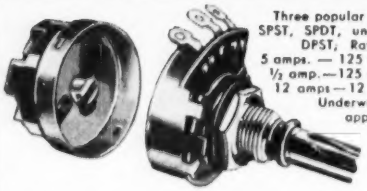

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City ..... ( ) State .....

treas.; GTC, GRI, PFU, and K2BKU, directors. YIK has a new HRO. DIM passed his General Class exam and will be on 3.8 Mc. soon. TYC lost his 3.5-Mc. antenna and now is on 7 Mc. MRQ is experimenting on 420 Mc. and has increased power to 200 watts on 3.8 Mc. OKI is working DX on 3.5 Mc. with an ARC-5 and a half-wave dipole. Congrats to K2BSD on making BPL, also for a job well done on MHT. IJG is on s.s.s.c. PCQ has a potent mobile signal on 144 Mc. MVS has a new Gonset on 144 Mc. from Newburg. New on 144 Mc. are KNs DQW and DQY. RTE is doing FB with the new 64-element beam on 144 Mc. A new ham in Troy is K2DIS. Traffic: (Dec.) K2BSD 526, W2IFP 255, LRW 142, EFU 109, K2EOQ 80, W2MRQ 73, APH 58, GDD 32, TYC 28, ILI 19, OKI 11, WSS 1. (Nov.) K2BSD 78, EOQ 18.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry Dannals, 2TUK. SEC: ZAI. PAM: JZX. RM: VNJ. The Nassau 10-meter AREC Net reports many thanks to KRP for an FB job in making up the emergency 'phone calling list. About 75 Nassau County members are RACES licensed. ZAI reports with regret the resignation of UWG as EC for Manhattan; K2BBC is taking over. DXV recently qualified for QCWA membership. K2BGZ is being shipped by Uncle Sam to Colorado and will be /ø for three months. GDO has been discharged and is back on 40 meters. K2DNO has a Viking on the air. IQR worked 3VIR almost nightly during December on 220 Mc. using a 9003 final. OMH is building a new beam for 220 Mc. MGQ has an 832 on the same band. QOX and HG also are consistent operators on 220 Mc. VNJ reports December was a busy time but poor conditions hindered NLI net operations (look at those traffic totals) and JOA runs 10 watts on 40 and 7 watts on 80 meters in case you think high power is necessary for traffic work. Congrats, Merv. IVF also runs 10 watts. K2CQP with 30 watts on 80-meter c.w., worked ZL and YV. MUM and JOA received A-1 Operator Club certificates. TAN members recently had a meeting at W1AW with 40 present. CQP, EWB, and EBU are new members of the NLI 2-meter Net. DGF is building an all-band rig. KAC is on 144 Mc. with a 100-watt rig. VUZ, KVW, JDN, GPQ, ZJJ, VL, and JZX are most active on the 75-meter 'phone net. New officers of the Staten Island Amateur Radio Assn. are HXV, chairman; VKF, secy.; GGJ, treas.; IPA, rec. secy. ELF has a new converter for 2 meters. WL resigned as Official Observer because of the pressure of business. AVB is on 420 and is going to 220 Mc. for a tryout. KJG had to move the antenna and ended up on 20 meters in place of the usual 75. IDK resigned as ORS and gave up traffic net operation because of school activity. W2AEE 5, WIYU 0 was the score of a recent radio chess game between Columbia and Yale. W2AEE has Novice and advanced group training plans underway. EC is doing good on 75-meter 'phone with a cathode modulator. IVS, busy at school, has been DX hunting on 3.5 Mc. GP increased power but ran into TVI problems. BIC dropped the "N." IN is going in for s.s.b. and has a sheer going. PE has a new 75A-3 with 100-kc. crystal calibrator. K2BIO is the new president of the Amateur CHE Club. OKX is vice-president, ZBG treasurer, QPQ secretary, with DVK and DKH ELBEC delegates. The Levittown ARC group (MUM) is converting ARC-4 for 144-Mc. work. LGK reports K2ORK, CUI, and W2ESO have joined his ham orchestra. He wants more members. LGK is on 10-meter mobile. OME reports that the long skip on 75-meter 'phone is hampering traffic-handling. CGX is doing good DO work. New officers of the Tu-Boro Radio Club are LG, pres.; MES, vice-pres.; QYS, treas.; SM, fin. secy.; BOT, secy. BUA, IBS, LOK, and K2BCB are new members of the New York Radio Club. KAY can be found on 14,150 kc. as DLAGC at 7 A.M. Fri. OME is back on 75 meters with a gallon. The first seven stations in the traffic listing below made BPL during the month of December. JZX has a new Tech Craft 2-meter converter. CLG has a new Millen GDO. TUK is in Alabama and GF is in Tennessee. UCB moved to Minneapolis. Traffic: (Dec.) W2JOA 873, VNJ 763, IVU 605, KEB 570, AEE 456, NJL 331, EC 254, KFV 246, K2CQP 140, W2LPJ 138, JZX 119, GXC 116, IVS 77, OMG 77, GP 48, IN 33, PE 27, LGK 24, IIG 21, OME 12, MUM 4. (Nov.) W2AEE 114, OBU 59, LGK 38, MUM 2.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RMs: NKD, CGG, WCL. JLX again is active on 10 and 20 meters after serving a hitch in the Air Force. A new Viking II and an RME-45 round out the new station. HXP is active on 2 meters in the AREC and in c.d. work. K2BWP, age 14, made BPL this month. He reports a new traffic high with a total of 233. Congrats to you, George, and keep up the good work in the TCPN. K2BWQ, his dad, is a new MARS member with a new call, AA2BQW. CGG, our RM, is in there pitching this month with a traffic total of 244. Section Net certificates went to K2CCF and W2JCO for their keen interest and participating in TAN. The section has been informed of the passing of W2CUL. His enthusiastic support of organized activities within the Northern New Jersey section will long be remembered. New RVRC members: K2AAQ, K2EUN, W2IZY, and KN2GAS. UM, charter member of RVRC (1927), was guest speaker at the Club's Christmas party. K2ASX has moved to California. K2CHI

(Continued on page 76)

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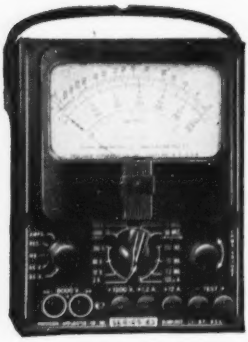

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is active in CAP activities. W2AJB spent the Christmas Holidays at his home QTH. RVRC code classes have a good attendance. Interested parties should contact QW at club headquarters for enrollment. RGV renewed OPS appointment. DXD visited VE2ATC and VE2AKT while on a recent trip to Montreal. He reports both stations are very active in RTT work in Canada. JCO and JDH are forming the East Coast Net on 40-meter c.w. They need new members in the first four districts. New members wishing to join, contact JCO. The Avenel RC has the following members: FSL, JDH, JCO, K2AFQ, CLL, DSW, and DYF. This is a new club formed last summer which meets weekly. Prospective members should contact W2JCO. CQB has crashed through with a traffic count of 698. Bob says he had more time this month for ham activities so was able to get 18 countries in addition to that fine traffic count. NIY, GVZ, and TPJ sent in their usual excellent OO reports. The SCM can always count on the Faithful Three for a job well done. DME was right on the nose in the last Frequency Measuring Test for OOs. The GSARA had a very successful annual dinner and dance party Jan. 27th. K2EBL is on a vacation trip to his home in California. K2DHE is back from a holiday trip to Cleveland. NIE has rebuilt the shack to accommodate the new rig. ENM has a new 75A-3 receiver. BTG has had to consolidate the basement shack with the XYL's ceramics studio. The background noise you hear when working YLS is generated by DX, his new parakeet. Traffic: (Dec.) W2CQB 698, CGG 244, K2BWP 233, W2EAS 164, JCO 63, DXD 62, FPM 30, CJX 18, HIA 5, HXP 3, NIY 3, GVZ 2. (Nov.) W2JCO 86.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — SCA and BDR finished out their 1953 traffic with a bang. Doc's total for the year was 13,956. Russ didn't break his down but they are the uncontested 1 and 2 traffic men in Iowa. AIX spent Christmas in the hospital but is coming along FB now. NYX reports that five 2-meter stations in Waterloo are looking for contacts around the State. YTA reports that he worked my brother, UZE, at Lincoln, Nebr., on a peanut whistle. FB, that's better than I can do. LCX still is working on his transmitter. PUR is going mobile with Command transmitters on 160, 75, and 40 meters. He has an independent 12-volt system for transmitters. WNØPAN has worked a total of 185 stations in 18 states. GXH reports the death of NUQ. NCS of the S.D. Net. QVA reports OZO is on with his ½-kw. final. GSH, HXA, KSF, and LJW have received their Iowa Section Net certificates. TLCN now meets at 1830 in an effort to beat evening skip. FDL reports that the City of Muscatine has allotted $700 to be used by hams for the purchase of Gonset 2-meter gear for c.d. use. KSF is building a new 813 final. NYX is back after building his rig to desk-top dimensions and now has an 814 working at 100 watts. New officers of the Iowa-Illinois Radio Club of Burlington are MDU, pres.; NLA, vice-pres.; Roy Uffelman, secy.-treas. Traffic: (Dec.) WØSCA 2723, BDR 2357, CZ 375, OZO 253, PZO 176, QVA 141, BBZ 112, GXH 103, YTA 40, BLH 35, PUR 13. (Nov.) WNØPAN 2.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: KXL. The Central Kansas Radio Club of Salina elected new officers Dec. 18th as follows: YRN, pres.; JFE, vice-pres.; PKD, secy.; and LXA, act. mgr. The c.d. station in Salina has a new NC-183D. MBH has a new BC-610. New 1954 officers of the Jayhawk Amateur Radio Society of KC are ZGK, pres.; MIG, vice-pres.; and PNN, secy.-treas. The JARS meets the 3rd Wed. of the month. New 1954 officers of the Scott County Amateur Radio Club are YIO, pres.; ROZ, vice-pres.; ZUX, secy.; EUP, treas.; and QNJ, act. mgr. The Johnson County Radio Amateurs Club had a very successful Christmas party with more than 55 attending. The Club has purchased a new Viking II with ECO for the club station. The KVRC of Topeka held its annual banquet Jan. 8th and elected MXG, pres.; KXB, vice-pres.-treas.; BD, secy.; UPU, pub. chairman. KSZ and QV were reelected to the board of directors for 3-year terms. WNØPLS, of Perry, now has 33 states toward WAS. BXK, of Wichita, has completed building a Viking II and will be active again after being off the air since 1943. FDJ, of Linn, has a new Collins 32V-3. Congratulations to BLI, OHJ, and NIY on making BPL again this month. Traffic: WØOHJ 820, BLI 609, NIY 370, YOS 98, EOT 73, FSE 53. HS 49, LOW 36, YFE 35, QQQ 32, FNS 29, JDX 29, MLL 29, FEO 28, HFP 27, GCJ 26, MLG 26, MXG 26, FDJ 24, VBQ 18, ICV 17, LIX 16, KSY 12, MAE 12, WNØPLS 12, WØBET 11, FHC 10, ONF 9, KXB 7, ZUX 6.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL, BVL. RMs: OUD, QXO. Missouri lost another active ham when OJC passed away Dec. 5th. The Lebanon Amateur Radio Club has been organized and has elected the following officers: QGR, pres.; PUA, vice-pres.; NGX, secy.; KZR, pub., and EVN, tech. adviser. The SMARC has elected the following officers: ICW, pres.; NHO, vice-pres.; JHY, secy.; and BHC, act. mgr. RFV (ex-W2VAV) is located at Kirkwood and is on the air with a Viking II and NC-183D. OUD's OM received severe burns while working on her rig. He had to jerk it off the table to break contact and the rig was damaged in the fall so OUD

(*Continued on page 78*)

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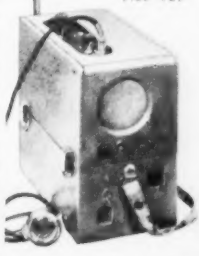

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has been off the air. 9LHB/Ø has received his 1000 Traffickers Club certificate. PKV has a new rig on the air with an 813 in the final at 225 watts. BAF is collecting old radio equipment, especially b.c. and ham receivers. The St. Louis University Club scored over 100,000 in the SS. JHY has added an 8-52 to his station. BVL reports that the Early Bird Net set a new traffic record total for December. QXO reports that KOMU-TV has improved the TVI conditions in Columbia. QMF received a Gonset Communicator for Christmas. GAR, LIS, and FLN win their first BPL certificates. CPI and QXO come through again to make BPL. New AREC member: WNØQZV. FLN is rebuilding the final amplifier. Traffic: (Dec.) WØCPI 1278, QXO 673, GAR 552, BVL 484, LIS 351, CKQ 147, FLN 114, ETW 109, GBJ 76, KIK 61, EBE 44, WAP 37, CXE 23, HUT 19, OUD 13, ICW 12, PKV 12, ECE 10, BZK 8, QWB 8, WIS 7, JHY 6, BUL 4, QMF 4, SPR 2. (Nov.) WØBAF 8, ETW 6.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Thomas S. Boydston, ØVYX. SEC: JDJ. New stations reporting in to the 75-meter 'Phone Net at 12:30 each day are RRH, CTQ, PPT, LGT, and NHS. NMN has joined the watchers by monitoring 3983 kc. daily from 8 A.M. to 4:30 P.M. Anyone wishing to help the Omaha boys in their monitoring of 3983 kc., please let them know. VYX, NCS for the 'Phone Net, gives the net activities for 1953: Total members on roll 82, with daily average of 41. ASI now has his s.s.b. 304-TL kw. final running and has his s.s.b. mobile perking, too. IRW reports he has no toll phone service to seven towns, so give him your traffic. RIG now is using a pair of 3C24s in the final. RDN worked his head off but made BPL. NET is all set with mobile rig and receiver. The North Platte Club has decided (because of s.s.b.) to move down to 3945 kc. LRK has his HT-9 back in operation. JHI has moved back to Scottsbluff. VQR is trying s.s.b. Monitor 3995 kc. every Mon. at 6:30 P.M. for North Platte Official Bulletin Stations giving news in and around North Platte. Traffic: WØRDN 1015, TQB 357, ZJF 144, KØWBF 78, WØVYX 68, NAA 62, JDJ 56, KDW 39, CBH 34, HTA 34, MAO 29, HSE 28, EUT 21, LRK 15, EGQ 13, KXD 12, QHG 10, KLB 8, DDP 7, IBA 7, HQN 6, ORW 6, AEM 5, QOU 4, RAM 4, IRW 3, NGZ 3, FMW 2, PPT 2, BEA 1, HXH 1. (Nov.) WØTQD 3299, JDJ 42. (Oct.) WØTQD 2872. (Sept.) WØTQD 3451.

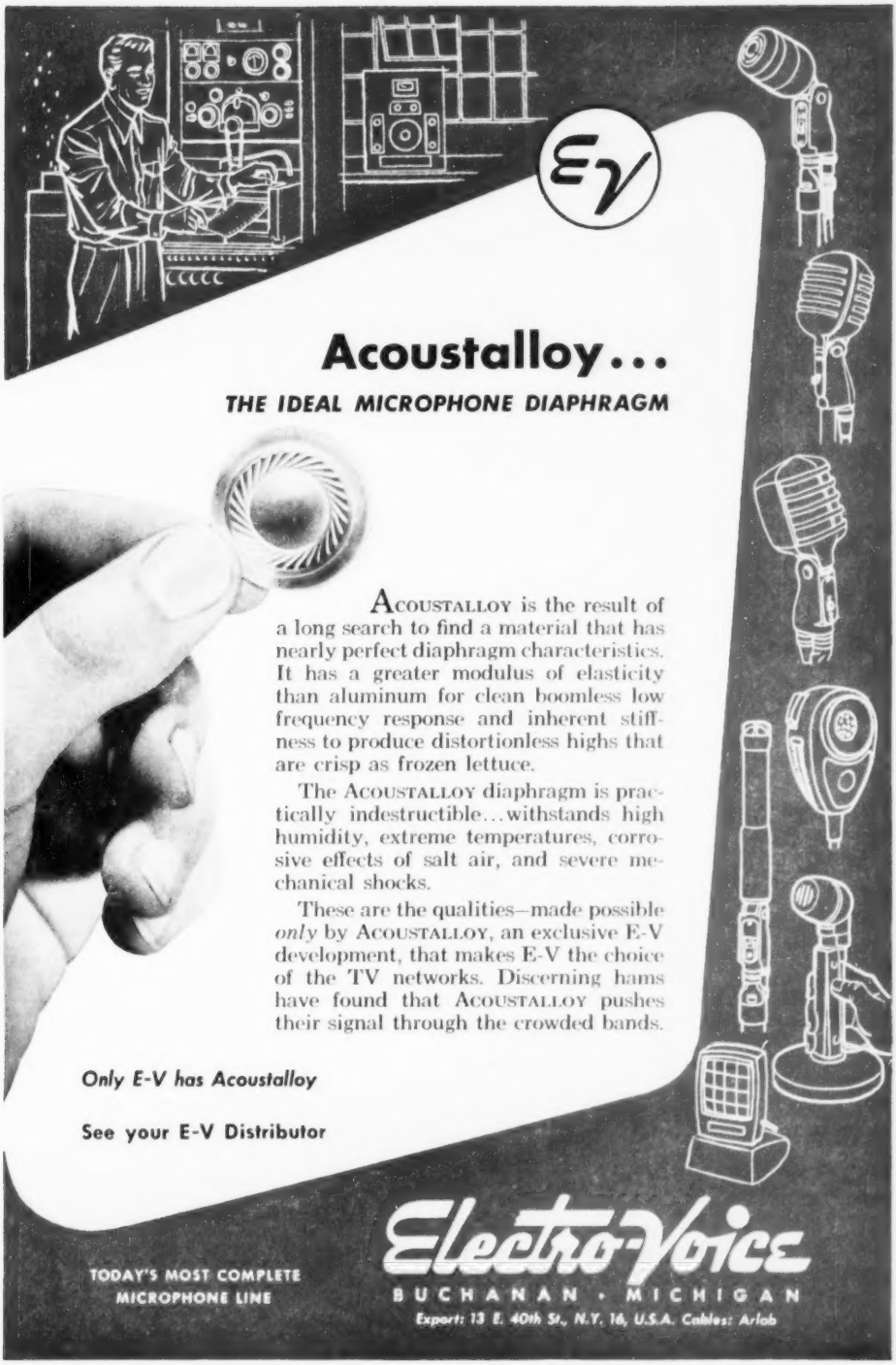
NEW ENGLAND DIVISION

CONNECTICUT — SCM Roger C. Amundsen, WIHYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640 kc., CPN-3880 kc., CEN-29,580 kc. SJO maintains his record-breaking traffic activity with his 6E3 total. The Stratford gang has only Saturdays in which to rest. The sked: Mon., Intertown Net; Tue., code class; Wed., club meeting; Thurs., YL C.D. Net, Fri., RACES; Sun., 2- and 10-meter nets. BVB is turning to high-power so we can hear him on A.M. CN. UNG received a Net certificate for his active work in the Teen Agers' Net (TAN). ODW likes 21 Mc. KYQ renewed ORS appointment. Many appointments have been cancelled. There is no sense in having "paper appointees." URF is interested in OES appointment. ORP has been working on TIE. RAN finished the new portable. KML and JVM are using plug-in modulators. LIG reports that the Deep Sea Dragnet presented our SJO with a scroll. The Norwalk Club has lots of captured gear to be given away to those who attend meetings. RMZ, OHI, and NOM brought some home recently. The V.H.F. Sweepstakes had lots of Connecticut participants. If you want longer columns, you will have to get busy. Traffic: WISJO 613, AW 292, UNG 214, EFW 189, LIG 139, KYQ 98, CUH 77, RRE 73, ETM 59, HYF 52, YBH 52, YYM 38, VOV 36, BDI 33, QIM 32, BVB 31, RCJ 26, WPR 16, BFS 11, ODW 9, SJ 9, KV 8, RAN 4, ORP 2.

MAINE — SCM, Bernard Seamon, WIAFT — SEC: BYK. PAM: BTY. RM: OHT. The Sea Gull Emergency Net meets Mon. through Fri. on 3960 kc. at 5:30 P.M. The Pine Tree Net meets Mon. through Fri. on 3596 kc. at 7 P.M. The Sheepscot Valley Net meets Mon. through Fri. on 3710 kc. Sorry, but the meeting time is not known. The Barnyard Net meets Mon. through Sat. on 3960 kc. at 8 A.M. This is a new one and will bear watching. VYA is NCS; WRZ is his helper. This net has 115 members from all New England and New York. GJY is drawing up membership certificates to make it all legal and official. OHT reports that he has been having a tough time with the conditions on the band this winter. I agree, propagation has been very erratic here, also, although during late December European DX came through on 75 meters in the early evening very well indeed. AMR is on from his new QTH with a TVI-proofed 26-watter that really puts out. CRP left his duties at CSH long enough to get on the air recently. It was good to hear FIL once again. Now if we can persuade FBJ and JAS to rejoin us all will be well. If you guys and gals want to read it, you'll have to send it to me. Traffic: WILKP 213, TWR 100, OHT 67, VYA 67, BEU 34, BX 29, BTY 20, LYR 15, UZR 9, AFT 5, JIS 4, SRW 4, BZF 2, EFR 2, FJP 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., WIALP — New appointments: OUL as EC for Chelsea, VMD as OBS. Appointments endorsed: As ECs — QFN Fall River, HRY Wellesley, RCJ Marlboro, BHD

(Continued on page 80)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S103T • Std. 10m 3-El. T match, $18.95. 1 — 8' Boom, ¾" Alum. Tubing; 3 — 6' Center Elements, ½" Alum. Tubing; 6 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D103T • DeLuxe 10m 3-El. T match, $25.95. 1 — 8' Boom, 1" Alum. Tubing; 3 — 6' Center Elements, ½" Alum. Tubing; 6 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

S104T • Std. 10m 4-El. T match, $24.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ½" Alum. Tubing; 8 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D104T • DeLuxe 10m 4-El. T match, $30.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ½" Alum. Tubing; 8 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

15 M. BEAMS

S15ZT • Std. 15m 2-El. T match, $22.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, ½" Alum. Tubing; 2 — 8' End Inserts, ½" Alum. Tubing; 2 — 2' End Inserts, ⅝" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

D15ST • DeLuxe 15m 3-El. T match, $39.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 2 — 8' End Inserts, ½" Alum. Tubing; 2 — 6' End Inserts, ⅝" Alum. Tubing; 2 — 2' End Inserts, ⅜" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T). $21.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S202T • Std. 20m 2-El. T match. $24.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅝" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Mount.

D202N • DeLuxe 20m 2-El. (No T). $31.95. 2 — 12' Booms, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅝" Alum. Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, $34.95. 2 — 12' Booms, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅝" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

S203N • Std. 20m 3-El. (No T). $34.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S203T • Std. 20m 3-El. T match. $37.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅝" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Mount.

D203N • DeLuxe 20m 3-El. (No T. $46.95. 2 — 12' Booms, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅝" Alum. Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

D203T • DeLuxe 20m 3-El. T match, $49.95. 2 — 12' Booms, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅝" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

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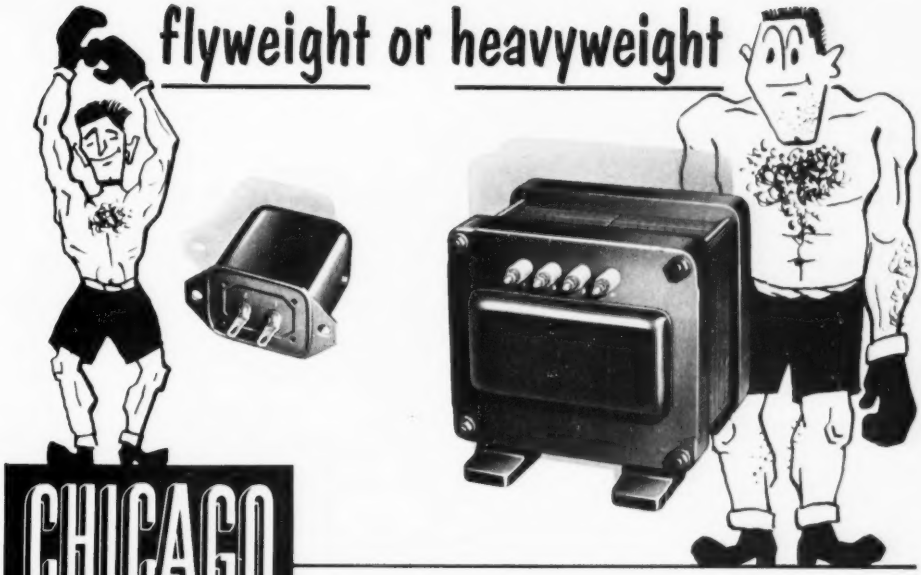
Everett, SH Dedham, IBE Rockport, INC Melrose, IPZ Shirley, RSE Whitman, PAN Billerica, RRA Winchester, LJT Brockton, PYT Ipswich; QVN, Randolph and Holbrook; as OBSs — BHD, AAR; as ORSs AAR, LM, BB; as OPSs — AAR, RP, BB; as OES — LJT. Heard on 10 meters: NBE, WCB, LJT, QLC, YEO, VHE, VRK, YYE, mobile YOR, ZPI, HYZ. On 2 meters: QW, CMW, QJF, UIM, UUQ, and JNX. THE and NKS are on 2-meter mobile with a Gonset Communicator. QAF has an 813 on 3.5 Mc. 4VBK/1, in Boston, has been handling traffic for the servicemen. HZR, now in West Roxbury, is on all bands. YHM passed Tech. Class exam. NF joined the local c.d. group. VMD is on 10 meters. SS has a gold QSL card for his 50 years as an amateur. If you work 10 members of the South Shore Club, send the list to Box 8, Quincy, Mass., and you will receive a "WSS" certificate. The Quannapowitt Radio Assn. had a talk on a Johnson Viking by a representative from Evans Radio. KBN has 1 kw. on 20-meter 'phone and now has 65 members. The Region 5 Radio Comm. meeting was held in Cambridge with KTG, RM, BL, ALP, NJN, DOF, and Col. Platt from the States C.D. Headquarters. TWQ is living in Somerville and attending Tufts College. UKO has a Viking II and is on 75 meters. EPE has a sked with DL4DB. LM has a sked with 9OR and 9EBL on 40 meters. UTH went to ARRL Headquarters for Teen-Age Net get-together. WU's mobile rig is working FB. Sorry to have to report the death of HSB. WK, BGH, and PXH took part in the November F.M.T. RP moved to Wayland and will have more room for sky wires. RCJ is building for 6 meters and has a TBS-50. The Merrimack Valley Amateur Radio Club elected SZO, pres.; VBO, vice-pres.; Alvin Harvey, secy.; YXX, treas.; SSZ, act. mgr. Board of Directors: SZO, VBO, Alvin Harvey, YXX, SSZ. Club trustee JED, GTR director. The Southeastern Mass. Amateur Radio Assn. held a Christmas party. WGN bought a new 10-meter ground-plane antenna. SSS got rid of a bad power leak near his QTH. The Wellesley Amateur Radio Society held its annual Christmas Party for the XYLs, YLs, and jr. operators. BB had the Winthrop gang at his QTH for the annual get-together as follows: BDU, DJ, OIR, UOC, MQB, QUX, NMX, CMW, HFJ, TQT, SBT, PBX, TTH, GGP, VIS, along with the XYLs and YLs. Those on at the last drill were SBT, BDU, CMW, MQB, UOC, VIS, QUX, DJ, OIR, SBT, mobile, with BB. IBE has an NC-183D and is in the TCPN. MME is handling a lot of traffic from TCPN. Among those taking part in the Section 5 monthly simulated test were WFQ, IS, FVD, K2ADA/1, TYN, EKG, KWD, SH, VPR, CQN, THY, DW, ALP, AYG, YOR, MPT, and TQQ. GOU is building a new tower for his beam. New hams: YLW and YLU in Ipswich; YLV in Essex. JOJ renewed OES appointment. DOF says there is lots of DX on 75-meter 'phone. The KBN Club, in conjunction with MARS and F.C.C., is working to eliminate industrial QRM during the daytime. UFM is secretary of the Quannapowitt Radio Assn. The Club had a talk by Karl Stern of the Andrews Corp. on Ground-Plane Antenna. Traffic: (Dec.) WIEMG 809, TY 518, MME 220, AVY 146, LM 95, UKO 77, UE 46, UTH 33, BY 27, EPE 17, NUP 14, KBN 11, WU 10, DOF 3, AHP 2, ALP 2, AKS 1. (Nov.) W1UKO 31, EPE 29, AOG 11, DOF 5, PYM 3.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. and 8 P.M. on 3560 kc. New appointees are SRM as ORS, VNH and PHU as OESs. UKR made BPL this month. TTL has built a carrier injection oscillator for s.s.b. reception and is fast becoming a convert. BDV is trustee of ZPJ, new R.C. station of the Whitinsville H.S. of which he is principal. WEU is pres. and YHU is vice-pres. of the club. UVI is coaching WN1ZBA for his General Class exam. TVJ took time out from traffic work to catch four new countries on 80 meters. SAS has moved to a new location and is a new OPS. OBQ raised a new 20-element beam for 2 meters with the help of MNG, TTL, and VNH. WN1ZAM worked Kansas for some good DX on the 7-Mc. Novice band. QWJ gave a lecture-demonstration on s.s.b. for the HCRC. TAY worked VP9BK on 75 meters and got a 20 over 9 report with 15 watts. JRA is on 2 meters with a converted 522. WN1ZPB is a new licensee at Amherst College. K1WAV, at the Springfield Armory, rolled up a nice traffic total this month with WCV, WDK, MNG, and AAY doing most of the operating. HRV lost his receiver during the SS but finished strong with his old SW-3. VKY is back from Korea and is active in Hampden. THD is eating venison from Maine. UPF is active on 75- and 40-meter 'phone. LFI has a new 10A s.s.b. exciter and a Collins 75A-1 and can be found regularly on the high end of 75 meters. KK also has a new 10A while JYH is on s.s.b. with a homemade phasing rig. VLM has a new Babcock mobile in the car and has been working good 15-meter DX with it. LIB would like to hear from hams around Webster who are interested in forming a radio club. GUI and SAS renewed their appointments. How about yours? Traffic: W1UKR 503, TVJ 225, K1WAV 196, W1BVR 103, HRV 67, MNG 67, SRM 43, TAY 28, WDW 27, AGM 11, JYH 10, RRX 10, DVW 7, RLQ 7, JRA 6, GVJ 4, JAH 1, OBQ 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. The new EC for Grafton County is VEG. GTY now is working in New York State. The PCARC has the following Official

(Continued on page 82)

flyweight or heavyweight



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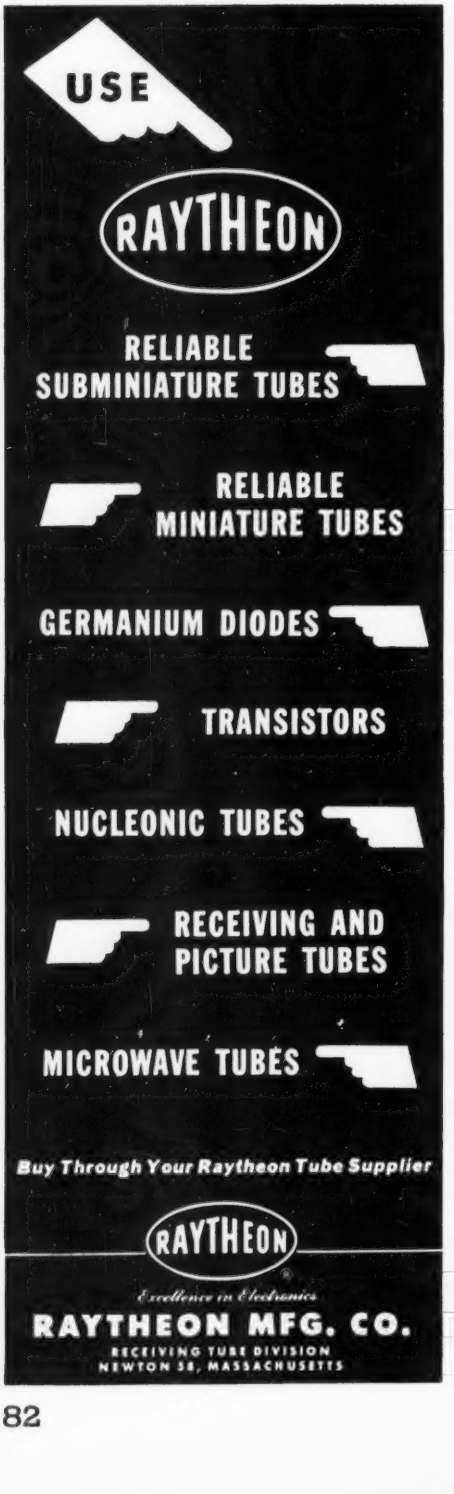


Mobile rigs on for emergency work: YFZ, YMJ, TWP, TDV, and RZX. Also the club has two Emergency Units, QXP and CDX. Present PCARC officers are TDV, pres.; LMD, vice-pres.; WN1YIL, secy.; WN1YIV, treas. The NHEN has eight out of ten ECs calling in each Sun. on 3850 kc. at 1300. Everybody is welcome to call in. TBS has a new Viking on the air with an FB signal. He is NCS on Trunk Line Atlantic-Pacific on Thurs. Have you earned your WANE certificate yet? CRW, TBS, and FZ made BPL this month. Just look at the total CRW had. Congratulations, and I think this is a record for BPL in New Hampshire. TNO had a fine trip to the West Coast this summer and ran across a friend of GMH's in California. Welcome to New Hampshire, TIS. BKB now is K6CWJ. CRW has a sked every Sun. morning at 1330 GMT with DL4EN for traffic. I notice Clif had a fine score in the CD Contest. When do you eat or sleep, Clif? Traffic: W1CRW 2177, TBS 325, FZ 146, CDX 44, QJX 31.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN meets every evening at 7 on 3540 kc. Mon. through Fri. The R. I. 'Phone Net meets every Sun. at 11 A.M. on 1890 kc. 4CVO/1 has been confined to his bed at the Naval Hospital in Newport for the past month — that's the reason his many air-friends have missed him. He is out and doing fine now, we are glad to report. News of interest to all local (Aquidneck Island) hams is that the 10-meter interference that has been pestering all of you has finally been located and will be cleaned up. After four years — success! Sorry to have missed that NAARO Christmas Party. As usual, it was a smashing success. The NCRC elected new officers and installed them at a banquet Sat. evening, Jan. 9th. Comments would be appreciated from all R. I. hams, affiliated or non-affiliated, on the idea of the R. I. Federation of Amateurs. Traffic: W1BBN 130, VXC 112, BTV 71, TGD 49, OIK 13, W4CVO/1 10, W1AIT 9.

VERMONT — SCM, Robert L. Scott, W1RNA — SEC: NIO. PAM: RPR. RM: OAK. VTN meets on 3520 kc. Mon. through Fri. at 1900 hours; VTPN on 3860 kc. Sun. at 0930; Green Mountain Net on 3860 kc. 1200-1300 hours Mon. through Fri. The GMN is a new noontime net in operation just a few weeks. It was begun primarily to handle Vermont traffic that band conditions were making impossible at 1900 hours on VTN. Now stations from New Hampshire, Maine, and New York are reporting in. With Portland, Me., Schenectady, N. Y., and Montreal, Quebec, all operating on channel 6, there seems to be a *few* TVI problems hatching out. SFE, VVP, JLZ, UOQ, PWB, and VZE seem to think they have a record of some sort — 5 hours and 15 minutes round table. Anyone gotta name? Contact VZE. Traffic: W1RNA 609, OAK 105, TEW 62, AVP 45, RPR 24, VVP 22, BJP 18, IT 16, ELJ 11, AXN 4, KJG 3.

NORTHWESTERN DIVISION

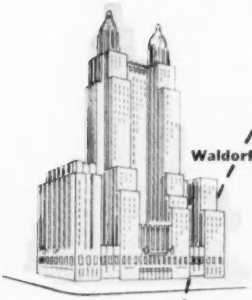
ALASKA — SCM, Glen Jefferson, KL7NT — KL7BK is back in circulation after engineering the installation and commissioning of KTVA-TV in Anchorage. PDG is doing FB work with his "V" beams at Kotzebue. All hands welcome W4WRA and his XYL, W4WRC, back to Anchorage from Falls Church, Va. They hope to reclaim KL7PJ and KL7YG. RZ, who, for the benefit of you Cheechakoes I will identify as Carl Shute, long of these parts, is giving forth with his mellow voice over a Viking II, and probably can be heard on 75 meters. With this issue NT signs out and AGU will take over as SCM next issue. NT hopes to find time to get back on the air in the near future.

IDAHO — SCM, Alan K. Ross, W7IWT — This is one month I find nothing on hand from you fellows to report so will write about what I have "heard" and "seen." RKI, Preston, puts out a nice little FARM Net Bulletin called *The Hambone*. I can get more news than I can use by reading it, but still prefer the news first hand. North Idaho: IPE puts out a terrific signal on 1995 kc. with 200 watts and a half-wave 60-70 feet high. Other good signals are NLJ, FRM, and RSP. This band is pretty good during the winter. The Boise Gem State Radio Club elected GHT, pres.; PKA, vice-pres.; and RCU, secy.-treas. Our 29.5-kc. Net has gone to pot — too much TV, and perhaps some TVI. Interest is picking up on 144 Mc. with DOH, JKB, OCF, NVO, and IWU on. IWU works out OK on 1995-kc. mobile, using base- and center-loaded coils in series, plus small capacity hat. Please drop me a line or two.

MONTANA — SCM, Edward G. Brown, W7KGJ — Our State Civil Defense Director has requested a roster of all Emergency Corps members. Any of you Emergency Coordinators who have failed to give your SEC your membership list, please do so as quickly as possible. Anyone who is interested in joining the Emergency Corps, please contact the EC for your area, your SEC, or your SCM for any information you need. JRG has a new job at KOOK-TV and has been too busy for much ham activity, but now that the TV station is in operation Ken will be busy on 6 and 2 meters again. PCZ has a new mobile in operation and also reports activity in the SS Contest with 360 stations worked in 65 sections. TKB worked his first Asian station in twenty-five years of hamming when he worked JA2WA on 3525 kc. CT has just completed a new grid-dip meter and is very pleased with it. Les used the circuit in QST. OPM has a new TV set so won't be as active as usual. KGJ is working on TV

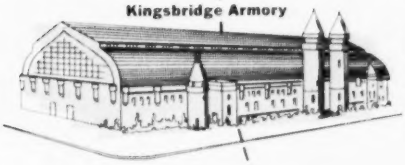
(Continued on page 84)

The eye-opening event of the radio-electronic new year!



For the past 12 months the vast, fast-growing radio-electronic industry has been preparing for 4 great days – March 22-25. This is when the IRE National Convention and Radio Engineering Show – the biggest and best ever – will take place in New York City. Be sure to join the other radio-electronic men – nearly 40,000 are expected – who will come, see and appraise the show at which all that is new will be unveiled.

A practical summary of radio-electronic progress will be unfolded at 54 technical sessions during the four-day period. 243 scientific and engineering papers, grouped by related interests, will be presented during these sessions, more than half of which are organized by IRE professional groups. Actually, you will be attending 21 conventions fused into one. New York's finest meeting facilities are provided – the Waldorf-Astoria Hotel plus 3 huge halls in Kingsbridge Armory. Transportation between the two locations is quick, easy – by subway and bus service.



At the show you will find over 600 firms **"spotlighting the new"** in their high-interest product exhibits. These will extend over a mile and a half along avenues appropriately named for radio elements: "Instruments," "Components," "Airborne," "Radar," "Transistor," "Audio," "Microwave," etc. These exhibits, an education and revelation in themselves, fill the four-acre space of the great Kingsbridge Armory . . . and can be viewed throughout any one or all of the four days.

Admission is by registration only, and serves for the four-day period. For IRE members the cost is only $1.00. For non-members it is a low $3.00, covering sessions and exhibits. Social events have been carefully planned. These are priced separately.

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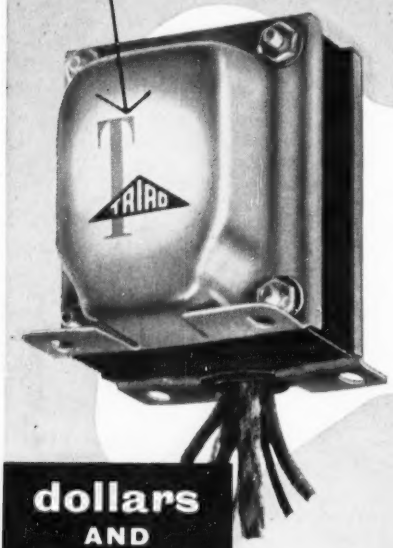

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installation and limited service for a local dealer. TAT is building a new transmitter and having TVI troubles. WN7SCG is working on TV installation. Traffic: W7SFK 100, PCZ 14, TAT 13.

OREGON — SCM, John M. Carroll, W7BUS — The Southern Oregon Amateur Radio Club advises that present officers are NLW, pres.; QMU, vice-pres.; OPH, secy.; and FTA, treas. AHP has been in W6-land visiting 6KOG and 6JAT. W7FTA, KEN, and MKA were active on OEN during a heavy coast storm handling emergency traffic. NLW wired up the Viking kit and it sounds fine. QMU is going mobile. UAQ now is active on 80 meters. NFZ has a 15-acre QTH with natural antenna poles. MEV is planning emergency gear for the SOARC. OPH has a new home under construction. ITZ furnishes good reports to the SCM. FY still is interested in the AREC. RDA, ADX, THY, TII, RQN, SHA, and WN7VBF all signed up with the AREC. VCH is Marsh Myers of Echo, Ore., using a TCS rig. FU is on more frequently. KTF is going mobile. KR is radio sgt. of Umatilla Mounted Posse. TVW was elected president of the Pendleton Radio Club, with KZF, vice-pres.; QBR, secy.; and BKD, treas. AJN reports that skip fouls up the traffic nets. The Cascade Traffic Net, on 29.2 Mc., had 50 members on with nine NCS handling 17 messages per QEI. TH advises the OS Net handled 13 messages, QNI 8, and NCS 5. AJN advises also of 21 sessions on OSN with 134 attendance, and high traffic one session of 14 and high QNI one session of 12. Traffic: W7QPS 112, PHJ 60, AJN 29.

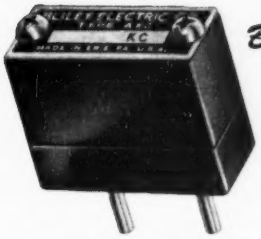
WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: QZF. RMs: FIX, OE. PAMs: EHH, PGY. PGY's and BA's 10-meter beams took off in the recent high winds, but both are back up and in business again. CO has his RTTY copying. Louie Anderson, WN7UZE, is proud of Novice Class ticket. SMB's XYL passed her Novice Class exam. LEC is kept busy with code instruction. SMB, HMQ, NZM, OIH, and OEB are mobiles and keep 10 meters active in the Valley. Mobiles SMB, HMQ, and OEB assisted the Pierce County Boy Scouts at the Scout Jamboree held at PLC Dec. 12th. TOU and QPX operated /7 from the Student Union Bldg. and dispatched the Scouts on their missions. The VARC c.d. gang very ably assisted in the Tacoma c.d. drill which was held recently. HMQ kept two rigs and three transmitters going at Midland, the Pierce County command station. PFZ was home for the holidays from Scott AFB, Ill. The c.d. gang received a call for communications support during the wind storm on Dec. 19th which cut power lines in the business district of Puyallup. PXY is building an 813 final. PRZ was home for Christmas from Cornell U. KT was so busy harvesting holly on his 400-tree farm that he by-passed radio during December. FIX has a new SX-71. EOF, formerly of Tacoma and now of Pe Ell, Wash., is back on the air after an absence of 15 years. The new Tacoma Amateur Radio Society is growing fast. SKT is new manager for the Sound Traffic Net, with PGY, asst. mgr., and QOU, net recorder. WNØRBE passed his General Class exam and soon will be operating from the YMCA in Bremerton. FM is installing a new Elmac. PKR is building his own 2-band mobile transmitter. CYY has been promoted to chief engineer of station KRLC. NMA, the Amateur Radio Club of Seattle Pacific College, is back on the air after three years' silence. UFD is the trustee. The Seattle Christian Amateur Radio Club meets the last Mon. evening of each month at the shack of NMA. SJL and his XYL, UXB, have a new harmonic. OWJ has a new Viking. EHH has his half-kw. rig working side by side with the XYL's TV set. FL gives OEN a hand during skip. PHV died of a heart attack. Traffic: W7BA 1848, K7FAE 1612, W7PGY 748, FRU 538, OE 350, QYN 258, RXH 211, FIX 192, AFS 142, ZU 73, ITQ 62, KT 61, EHH 54, BLX 32, BG 29, QOU 29, AIB 27, RT 18, SKT 18, AMC 17, EAU 8, TH 7, GAT 5.

PACIFIC DIVISION

HAWAII — SCM, James E. Keefer, KH6KS — All Hawaiian amateur groups brought 1953 to a very enjoyable end with various parties and with resolutions for bigger and better activities for 1954. KH6AJF has relocated in the Pearl Harbor Area and now sports its own power plant, rhombics, etc. Trust Territory traffic may be delivered via KC6UZ, KC6AA, KG6SA, KC6AG, and KC6SJ. UZ and SJ located on Truk, SA on Saipan, AA on Yap, and AG on Ponape. Some idea of the traffic volume handled by stations in the Far East is shown by the following monthly figures furnished by KA2HQ: July 9550, Aug. 18,815, Sept. 16,422, Oct. 12,367, and Nov. 14,620. KA7RC, KH6FAA, KH6AJF, KH6FAD, KA3AC, KG6FAA, KA7LJ, KA7SL, and KA2KS made BPL in December. At this writing your SCM is on Wake Island so any errors may be blamed on the XYL, KH6AFC. Traffic: (Dec.) KG6FAA 17,325, KA7LJ 10,004, KG6FAD 3008, KA7RC 2238, KH6AJF 2204, KA3AC 2018, KA7SL 1930, KH6FAA 1912, KA2KS 241 (Nov.) KA2HQ 917. (Oct.) KG6FAD 1132.

NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NRU, NWU, OXX, TJY, VO, and ZT. OPS: JUO. ORSs: MVP and NOW. HJ, LGS, and KIO are affiliated with K7NAH, USNR Training Center, Las Vegas. BKS is the new prexy of the Southern Nevada Amateur Radio Club. BVZ is experimenting with frequency shift keying without RTTY. Novice TGK is preparing for

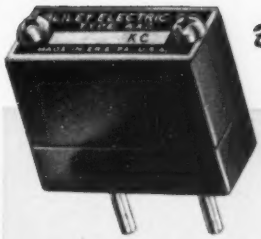
(*Continued on page 86*)



Bliley TYPE AX2

RANGE (kc)	TOLERANCE (kc)	PRICE
1803-1822 1878-1897 1903-1922 1978-1997	±1	$3.75
3500-3997	±5	$2.95
7000-7425 8000-8222	±5	$2.95
12500-13615 14000-14850	±30	$3.95

On crystals supplied to the tolerance above, the nameplate frequency is calibrated to ± .002% in factory test equipment. The drift is less than .0002% per °C.



Bliley TYPE AX3

RANGE (kc)	TOLERANCE (kc)	PRICE
24000-24333 25000-25500	±5	$3.95

Specially designed third overtone crystal produced for the Bliley CCO-2A oscillator. On crystals supplied to the tolerance above, the nameplate frequency is calibrated to ± .003% in factory test equipment. The drift is less than .0002% per °C.

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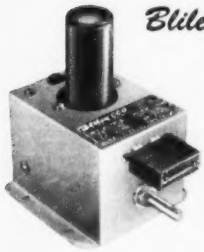

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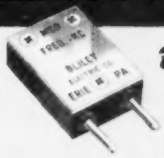

Bliley TYPE MC9

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RANGE (kc)	TOLERANCE (kc)	PRICE
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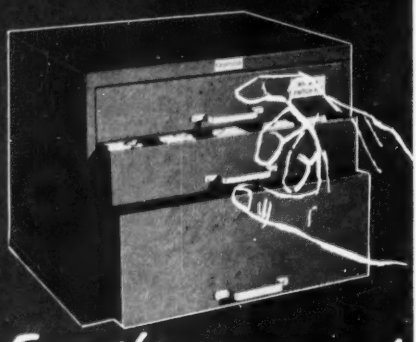

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his General Class exam. LLS, in Steamboat, is on 75 meters with a nice-sounding 600-watt job. SXD again is rebuilding his transmitter. Afraid of TVI, Kingsley? JUO is shielding his kw. NOW, of Stead Field, has been moving considerable traffic and has been appointed ORS. JU is dreaming up another 144-Mc. antenna with hopes of working the West Coast. To date no known Nevada station has done so. Traffic: W7NOW 380, JU 17.

SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6IZL — Most of the clubs held very enjoyable parties during December. WGO, past-president of the SCCARA, held that office for the past three years and the progress made during that time was nothing short of amazing. His term of office will long be remembered by all of us who are club members as well as those who had the pleasure of visiting the club during his stay in office. The MBRC held a White Elephant Sale and to keep in the Christmas mood had all the articles gift-wrapped. The PAARA held a business meeting, nominated officers for the coming year, and made plans for new quarters for the club meetings. The Mobileers had a Christmas breakfast in San Francisco which was well attended. The CCRC held its meeting in Berkeley. The host club was the SARO and the main discussion was on the ham calendar, which will be a very handy thing to have around any shack. The NPEC held election of officers and a very nice Christmas party. OTS now has a 'phone patch and got a grid-dip oscillator for Christmas. YHM is active on the nets again. FON is very active on MTN these days. AIT faithfully reports each month. K6BBD is home again and running 88.5 watts on 7 Mc. WGO really is going to town with traffic and is planning a 144-Mc. net in the near future. HC is busy as usual. MMG is back on the air. Traffic: W6WGO 679, HC 324, FON 98, YHM 93, AIT 30, K6BBD 2.

EAST BAY — Acting SCM, Guy Black, W6RLB — Asst. SCM: Harry T. Cameron, 6RVC. SEC: WGM, RMs: IPW, JOH. ECs: AKB, CAN, CX, DNX, FLT, NNS, QDE, TCT. New officers of the Napa Radio Club are MHN, pres.; HCY, vice-pres.; KN6AOM, secy.; KN6BBU, treas. For the NBARA its OUC, pres.; IZU, vice-pres.; ZZF, secy. The Richmond Radio Club elected PAV, pres.; EFD, vice-pres.; HFM, secy.; TWI, treas. The SARO officers are FZC, pres.; NQJ, vice-pres.; QVI, secy.; and UHM, treas. VCG is communications manager. The CCRC has re-elected RLB, pres.; with CGC, vice-pres.; MZO, secy.; and VCZ, treas. We didn't get the complete list of Mt. Diablo Radio Club officers, but DEX is pres.; and LIL is vice-pres. The MARS station at Travis AFB has made BPL for twelve straight months, a fine record representing plenty of long hours of brasspounding. The call at Travis has been changed to K6EDG from K6FAL because of the untimely passing of the trustee of the latter call. The word from the East Bay TVI committee chairman, B. W. McKinney, is that help is urgently needed in the Alameda and San Leandro Areas. Fellows, if you do not help out on the TVI job the FCC will start sending out the old, almost-forgotten, fifteen-day notices which you have not seen since the TVI committee first started handling the problem in a better way. *Don't let it happen.* Volunteer your services by calling Mac at KEllog 2-4199 or writing him at 3827 E. 14th Street, Oakland. BS spends Sunday A.M.S bragging about the fishing on the Russian River. US spent some time at the Boca Raton Club, Florida. FZC obtained a radiotelegraph first-class license again, the first being obtained in 1913! He's copying JZ's 45-w.p.m. code practice. The SARO reports its appreciation of KPO's important contribution to their 2-meter project. The SARO net frequency on 2 meters will be 144.27 Mc. The Skyriders were visited by OZ4FT, who will be returning to Denmark via KV4-Land. About April he will be looking for the many friends he made in California, so here's your chance for an OZ4 QSL. The Skyriders meet on the 4th Fri. of each month. See ANK for details. The 10-meter mobile gang still is active in the East Bay. The Skyriders have a net Wed. at 8 P.M. on 28.56 Mc. and the MDRC scheduled a hidden transmitter hunt in January. Traffic: (Dec.) K6FDG 1085, W6IPW 674, JZ 395, K6BDF 267, W6JOH 154, AKB 50, YDI 2.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — SEC: NL. The SFRC meets the 4th Fri. of each month. The December meeting was a Christmas Party held at the meeting hall, 51 Lakeshore Plaza. Former Director Ken Hughes was a guest of the Humboldt Radio Club. The division of the Sacramento Valley section was discussed and the HARC voted unanimously to remain in the San Francisco section. The TARC still is looking for man power to assemble the trailer mobile station. The SCRA is recovering financially from the recent XYL party. The lads from Larkspur are planning a return visit to the HAMS Club in San Francisco at the Red Cross Bldg. WB gave a splendid talk on v.h.f. antennas. The Naval Shipyard Club held an auction at its last meeting and now has money in the treasury. ZZC was a visitor to San Francisco for Christmas shopping. LOU is trading in all his surplus rigs and going 2-meter mobile. The Mobileers held their regular 3rd Sun. breakfast at San Francisco for a change. EJY did a fine job as sponsor. The CCRC now has a monthly activities calendar and all affiliated club members will receive a monthly copy. RLB is editor. HC and GGC are assistants. GHI put one over on all the California hams when he sent

(*Continued on page 88*)

THE INSIDE STORY

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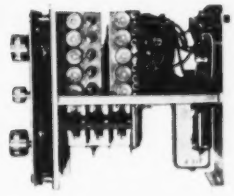
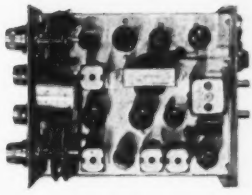
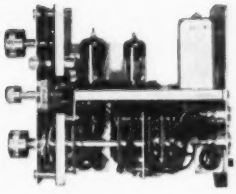


5BRF

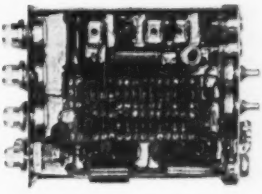
TOP VIEW



FTR



BOTTOM VIEW



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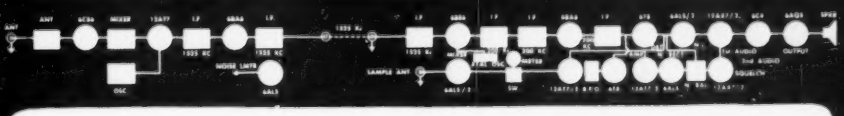

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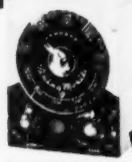

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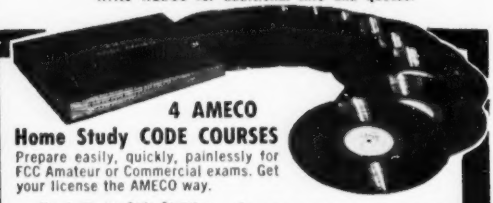

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out his Christmas cards which showed his car with the ham license plates displayed to all. He did a fine photography job and really had the boys guessing for a while. Congratulations to SWP and PHT on making BPL. The OO, GQA, still is sending out pink slips. NAC is busy with his job as Scout Master and isn't heard on the air very much. SWP made application for ORS appointment. URA is back on the air as the F.C.C. came through with his license renewal. All hands are awaiting the opening of new station KQED-TV on Channel 9 sometime in March. ATO reports the TVI committee still is in business but has all reported cases well in hand. AHH (mobile expert) found the trouble of the Vaaro antenna known only as Rose's Folly so Wally now has a signal that really gets out. The Amateur Radio Emergency Corps goes on the air every Sun. morning at 10:30 on 3900 kc. KZF, NOI, DNX, OZC, FFT, WGM, and GGC are some of the regular check-ins. The Annual Endurance Run of the San Francisco Motorcycle Club was held the same Sunday as the Mobileers Christmas Breakfast so the 29ers monitored instead and did a bang-up job. FVK was Net Control. OST, MXJ, PHS, MIY, BWT (K6), MTJ, LZT, LFF, and QMO participated. QMO stood by as relief for FVK. The C.D. Net meets on Mon. at 2000 PST on 144.654 Mc. NL is N.C., with CHP as N.C. every other Mon. night. CE1BG, of Chile, will make his home in San Francisco for the next couple of years. He has joined the San Francisco Radio Club. K6FCT now is handling traffic from Hamilton Air Force Base. Local entries in the recent c.w. section of the Sweepstakes included BIP, UOM, GCW, COL, EYY, NKR, DWJ, WQX, YC, NL, PZA, HPZ, K6ALF, NCG, ABE, and ANP. Traffic: W6SWP 702, PHT 277, K6FCT 250, W6GGC 68, GCV 25, GQA 7.

SACRAMENTO VALLEY — Harold L. Lucero, W6JDN — Your SCM paid the Radio Club in Redding a visit. KTO is in boot training at San Diego with the Navy. WN6RPS has gone into the Navy. ILY has new modulation transformer. HVB is going mobile. IOM is very active on 40-meter 'phone. IEO is active on RN6, OEN, MTN, and the Hobo Net. FKI and JDN furnished radio communication for the Christmas Parade in Mt. Shasta. GDJ is looking for a vacuum variable condenser for his final — 1 kw. ASI put up a new vertical radiator for 75 meters with gratifying results. VBI is building new 4-125A final on all bands. ESZ has returned to 75 meters after many years. PVI resorts to 144 Mc. solely to get away from TVI. LSB built new 50-Mc. rig for the V.H.F. SS. CLS, an old-timer, is a newcomer to 144 Mc. at Yuba City. HTS and LLR report weekly to the MARS Net. EKP has an 829B on 144 Mc. running 100 watts. KN6CKH now is on 144 Mc. at Auburn. KME is busy between 75-meter mobile and 144-Mc. fixed stations. QYQ won an Elmac A-54 at the SARC Christmas Party. QKJ is experimenting with v.h.f. antennas. ETO has a new all-band mobile rig, 6146 final, minus TVI. MIW is planning a new exciter unit with 6146 to drive 4-125A and also has a new crystal converter on 28 Mc. for the car radio. MTB is using a Viking driving 304-TL to a full gallon! AUO has a 2E26 in the final of his 144-Mc. mobile rig. FTH has an Elmac transmitter for both mobile and fixed station use. The chairman of the Sacramento TVI Committee reports the Committee is functioning very smoothly. JEQ, RNR, GDE, GDO, MSI, MTU, MIW, KME, HQF, and ETD all participate regularly in weekly 28-Mc. hidden transmitter hunts in the Sacramento Area. The Golden Empire Radio Club's new officers are ICO, pres.; QJD, vice-pres.; K6BMU, secy.-treas. TID is going s.s.b. SEN is active again with 75-meter mobile. REF is very active in the Mission Trail C.W. Net. The Sacramento Amateur Radio Club held its Annual Christmas Party Dec. 8th. ILZ was chairman of the Committee. The pre-Christmas meeting of the Shasta County Radio Club featured a Christmas tree. BIL has a new 75A-4. KTF says he has the hottest mobile on 75 meters north of the Equator. AWH has a new 829-B rig. AKF is mobile on 75 meters. CBY now has Conditional Class license and has a new rig with 110 watts. UFR is building high power

(Continued on page 90)

VOLUME FIVE

Hints and Kinks

for the Radio Amateur

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'PHONE

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KEYING

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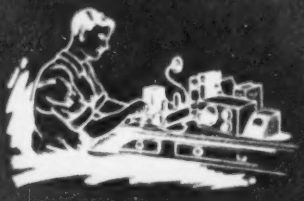

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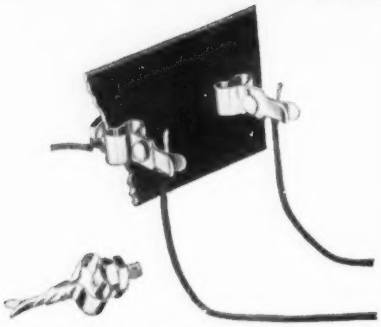

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Merely slip your wire between spring tension prongs for positive, rapid connection.

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Insulated, alligator type with silver overlay at point of contact and thermo-setting phenolic grips enclosing all metal parts—cannot short.

No. 16-R—Red grips
No. 16-B—Black grips

Ask for them by name —

Grayhill

513 Hillgrove Avenue, LaGrange, Illinois
Phone: LaGrange 8000

with p.p. 813s. ABO now is in Juneau, Alaska. OJB is back on a 2-meter schedule Tue. nights. Traffic: W6IEO 137, JDN 34, K6NAK 32, W6ILZ 1.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley W6GIW — SEC: KRO. RM: EXH, OPU is back in the traffic harness again and is taking over the reins of SJVN. This traffic net is on 3525 kc. every week night at 1900 and needs new members all over the section. Whether you have traffic or not, break in and you will be welcome. FEA is new vice-president of the American Legion Net. GRO is Chief Net Control. BNP is QRT in the Veterans Hospital in Fresno. JOD recently returned from the Navy and with his brother, MGP, soon will have a new 813 rack and panel rig on the air. TXM passed the 2nd-class radiotelephone exam. KRO has a HQ-129X, but still is bothered with TVI from neighborhood TV sets. EBL is acting as control for the Fourth Regional Defense Net. KN6BZJ has a new 70-watt final. AXI is using a new short-element beam on 20 meters. BCL is back on 2 meters with a pair of 4-65As and a complete new receiver. New officers of the Stockton Amateur Radio Club are ZNL, pres.; HQY, vice-pres.; PJF, secy.; IAZ, treas.; OEV, sgt. at arms. EBH now is mobile on 75 meters. DVI received a Viking for Christmas. OEV was NCS on the SJCEN for December. RRN has built a 220-Mc. walkie-talkie with excellent results. YGZ is building 220-Mc. gear and will be on soon. NNG recently received his General Class license. FYM was in Turlock during the Christmas week end, but his time was too limited and he had too many personal matters to allow him time to visit. Howard sent his best wishes to the gang. Traffic: W6OPU 31, WJF 30, FEA 28, TXM 28, EBL 15.

ROANOKE DIVISION

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — HWZ and NJG are now OBS and OPS. NTO is new on 2 meters. PDM has a new 4-over-4 beam on 2 meters. The Georgetown Radio Club boasts of a BC-610 in its club station and is working for emergency power for this station. Officers of the Georgetown Club are GIF, pres.; ZGP, vice-pres. and EC; CII, secy.; and COA, pub. mgr. DX is looking for anyone in the vicinity of Camden interested in making amateur TV contacts on 400 Mc. AUL received a Babcock mobile transmitter for Christmas. YOA is building a 10-meter rig and visited BMT during the Christmas holidays. TTG has ordered parts to complete his mobile rig. JGM, VJI, and WSA are in the process of installing new mobile rigs in Columbia. All 75-meter mobiles are invited to report into the mobile round-up at 2:30 P.M. each Sun. on 3930 kc. Those interested in handling traffic on c.w. are invited to report into the 4th Region Net at 7:45 P.M. or 9:30 P.M. on 3615 kc. on weekdays. FM has made WAC after trying since 1922; a QSL from 4X4DR did the trick: Traffic: W4ANK 382, YOS 7, TTG 4, FM 2.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: YPR. PAM: FGL. RMs: DFC, GBF, AUJ, HZA. The MARA will be sponsoring a West Virginia QSO Party this spring. It is requested that as many West Virginia hams participate as possible. WN8PJI and WN8PQF are new hams in Fairmont. MFF is attending school in Delaware and ELX is at W. Va. Univ. It is good to hear LS back on after several years layoff. 6RQQ needs West Virginia for WAS; he operates 7-Mc. c.w. It is requested that more

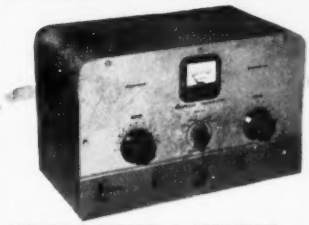
(*Continued on page 92*)

ANNUAL WEST VIRGINIA QSO PARTY

The Mountaineer Amateur Radio Association will sponsor the annual W. Va. QSO Party on the week ends of March 27th and April 3rd. The Party starts at 12:01 A.M. EST Saturday and ends at 12:01 A.M. Monday, and is open to all W. Va. amateurs and to all other amateurs who have held calls in W. Va. sometime in the past. Only these contacts may be counted. There are no power limitations. Any and all bands may be used and the same station may be worked on different bands for credit. C.w.-to-'phone QSOs are allowed but cross-band QSOs are not permitted. In working W. Va. stations score two points for each completed QSO when the following is sent and received: date, call, time, city, county. For contact with stations outside of W. Va. obtain the above information plus the call the operator held in W. Va. All logs must contain complete information sent and received: incorrect logs will not be counted. The following frequencies are suggested for finding W. Va. stations: 3570-3580, 3890-3900.

To be eligible for prizes logs must be postmarked not later than April 10th and be sent to George Ward, W8JWX, Vice-President of MARA, P. O. Box 909, Fairmont, W. Va. The high scorer will receive one Vibroplex Standard Model Lightning Bug; second prize — one B & W low pass filter; third prize — one ARRL *Handbook*; fourth prize — one new *Call Book*.

Heathkit AMATEUR TRANSMITTER KIT

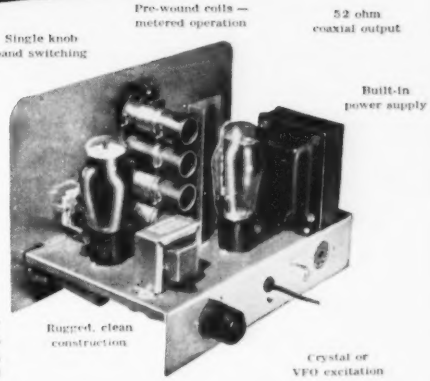


Range	80-40-20-15-11-10 meters
6AG7	Oscillator - Multiplier
6L6	Amplifier - Doubler
5U4G	Rectifier
105-125 volts AC 50/60 cycles 100 watts	
Size — 8⅛" high x 13⅛" wide x 7" deep	

MODEL AT-1

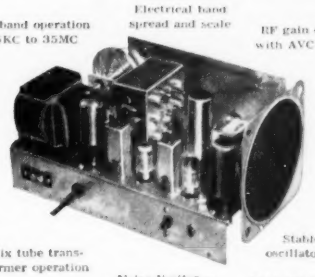
$29.50

SHIPPING WT. 16 LBS.

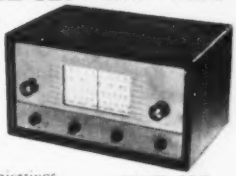


Here is the latest Heathkit addition to the Ham Radio field, the AT-1 Transmitter Kit incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation-up to 35 watts input. Built-in power supply provides 425V @ 100MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis and detailed construction manual. (Crystal not supplied.)

New HEATHKIT COMMUNICATIONS RECEIVER KIT


Four band operation 535KC to 35MC
Electrical band spread and scale
RF gain control with AVC or MVC
Six tube transformer operation
Noise limiter — standby switch
Stable BFO oscillator circuit
5½" PM speaker — headphone jack

Range	535KC to 35MC
12BE6	Mixer oscillator
12BA6	IF amplifier
12AV6	Detector - AVC - Audio
12BA6	BFO oscillator
12A6	Beam power output
5Y3GT	Rectifier
105-125 volts AC 50/60 cycles 45 watts	



A *new* Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical band spread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

$25.50

SHIP. WT. 12 LBS.

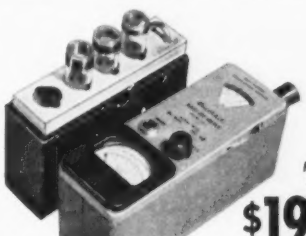
CABINET

Proxylin impregnated fabric covered plywood cabinet. Ship. wt. 5 lbs. No. 91-10. **$4.50**

THE IMPROVED *Heathkit* GRID DIP METER KIT

- **Pre-wound coil kit**
- **Range — 2MC to 250MC**
- **Meter sensitivity control**
- **Compact one hand operation**
- **Headphone monitoring jack**
- **Transformer operated**

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasitics, correcting TVI, etc. Receiver applications include measuring C, L, and Q of components, determining RF circuit resonant frequencies, etc. Thumbwheel drive for convenient one hand operation. All plug-in coils are wound and calibrated (rack included). Headphone panel jack further extends usefulness to operation as an oscillating detector.



MODEL GD-1A

$19.50

SHIP. WT. 4 LBS.

Two additional plug-in coils are available and provide continuous extension of low frequency coverage down to 355KC. Dial correlation curves included. Shipping Wt. 1 lb. Kit 341. **$3.00**

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West Virginia hams submit activities reports to the SCM. QHG is operating some 80-meter c.w. The Princeton Club is progressing very well. It is desired to have a section meeting this spring. The SCM would like suggestions as to where and when. Congratulations are in order to PNR for the way he handled the Forest Fire emergency. UYR is back on the air. AUJ and ETF are doing excellent jobs as NCSs of the nets. Let's all pull for LBT, who has had an operation. Hope you will be back on the air soon, Jim. Traffic: W8AUJ 878, GEP 95, ETF 34, DFC 32, MBA 24, ISB 19, PQQ 3.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: AEE. KHQ reports slow attendance on the newly-formed Colorado Slow Speed Net. RTA has been the main traffic contributor for the Net. Let's all get on and make the CSSN a big one. KHQ also built up the "simple" modulator that didn't work so well. EWH now has a new kilowatt rig on the air. HKE has been checking into almost every net that is in operation and built up a tremendous traffic count for December. Nice going, Harold. A nice letter was received from KQD with a lot of news in it. RTA is the call of the Sky Hi Radio Club station at Adams State College, Alamosa. The club station is active in c.d. and work is under way to secure emergency power sources. WNØOXP has assembled a Heathkit receiver and transmitter. WNØOXS is on the air with his new Heathkit combination. CVG now has a couple of new coon hounds and is burning the midnight oil trying to find raccoons around Colorado Springs. OYS has his new 'phone patch going. The Denver and Grand Junction Clubs are hard at work on the call letter license plates. Hope we'll have some progress to report next month. Traffic: WØHKE 15644, KHQ 1322, KØFAM 377, WØEKQ 209, BWJ 70, IA 14, OYS 14, CDP 3.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — MVD is the new president of the Ogden Club and CCC is the new president of the S.L.C. Club. LRV is running 150 watts to 24Gs on 2 meters when he is not operating 75 meters. GPN is Radio Officer for Ogden-Weber County c.d. set-up. Both GPN and SU, in Ogden, have been reporting in to the S.L.C. DCS group. Utah has an FB traffic man in UTX, who reports in regularly to RN6, RN7, TEN, and PAN. OSV is sponsor of the Olympus High School Radio Club, with RRM as president and WN7TFK vice-president. The UARC of S.L.C. now holds a round table on 3900 and 29,200 kc. every Mon. at 9 P.M. and would like to have more check-ins. RRM is the new editor of *Microvolt*, the UARC monthly bulletin. UTM now is mobile on 75 meters and is a member of S.L.C. c.d. To insure your participation in RACES, sign up with some c.d. authority in your area now! QYC is commuting between home and Provo, where he is working on a new movie production stage at the University. NWM has registered the Utah Air National Guard's station, K7FCN, in the AREC program. Traffic: W7UTX 66, UTM 24.

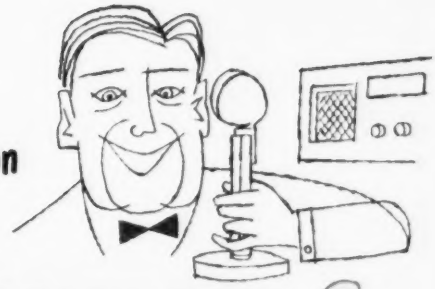
SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — RM: KIX. PAM: FGT. Your SCM again would like to ask that more individuals send in monthly reports. Only a pitiful few came in this month. OKJ, Oneonta, and KCQ, Tuscaloosa, are going on 2 meters. FGT is testing new 2-meter rig. We need more reports of 2-meter activity. WOG, Winfield; VCC, Oneonta; and DZF, Sylacauga, are new on 75 meters. BAI and ZSG have dropped the "N" and moved up to 75 meters. Congratulations. WN4BRE lost two fingers in an accident but still works c.w. on the new Viking. RLG made a good score in the YLRL Contest and asks other 'Bama gals to join in the fun. AUP got lucky on Dec. 26th, working EA2CQ, a YL, on 75 meters at about 1900. Birmingham is jumping with activity: ECI is sponsoring a new code class in the Birmingham "Y" conducted by JAM. ERW was swindled into drilling holes in the new Mercury for mobile. SDX has a new bandswitching fifty-watter in one-foot cube box. C.d. activity is shaping up with the Birmingham Club and c.d. officials acquiring a communications bus. EBD, YES, and RKS are busy with amateur TV. The c.w. net (AENB) needs a Birmingham outlet badly. Traffic: W4UHA 655, KIX 198, RLG 159, PWS 46, LSQ 14, DXB 12, KNW 10, EJZ 8.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — RMD is now F7CW, in St. Nazaire. His QTH is 472 EAB, APO 203, c/o Postmaster, New York City, N. Y. The Tampa Fair traffic reports should bring more into the inner sanctum. Bradenton: TAS (EC) reported all hams but one in the AREC. The Club built 2 pilot models of 144-Mc. rigs to increase interest. Deland: WS reports Area 144-Mc. Net members are WS, VXZ, WV, AYV, and QR. WS also works 5 'phone traffic nets! Jacksonville: PMZ and PNA moved to Hastings. WEO set up a traffic station at the Foley Lumber Co. office to speed overseas Christmas greetings. Leesburg: QBR says he, PJU, PZT, DIR, QBL, FE, and others have a net on 3945 kc. at about 0830 to 1030 in between buzzing the Dagwood. QBR asks if any one else heard PJU on c.w. Miami: IYT's Christmas gifts included a Viking kit. IEH reports the Club has a monthly

(*Continued on page 94*)

For a rig you can rely upon
Use dependable



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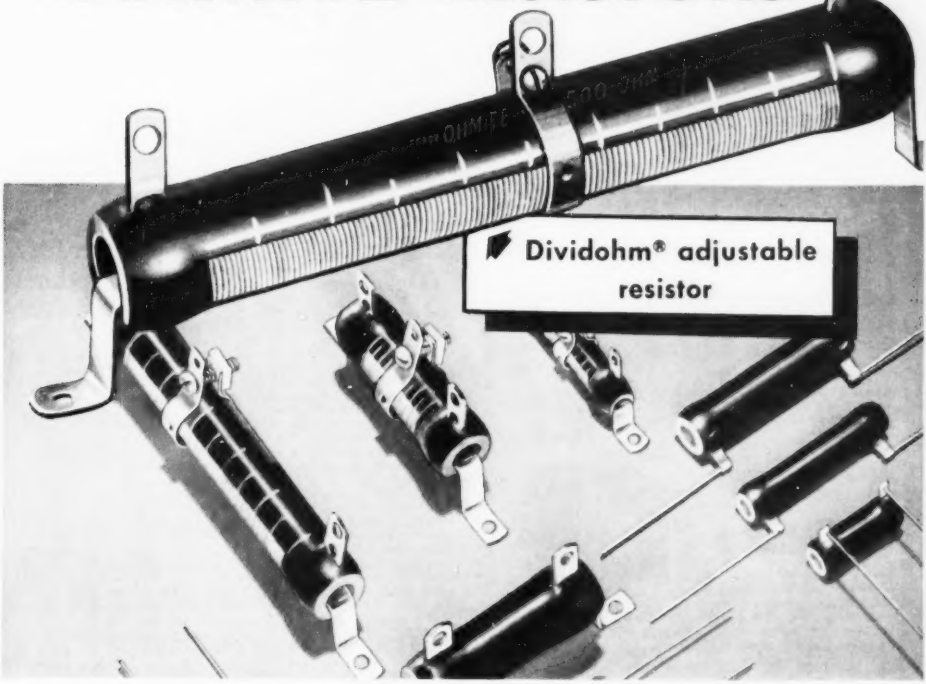

When you're on the air . . . and your rig goes dead . . . what can be more exasperating? Make sure it isn't *resistor trouble* by standardizing on OHMITE resistors, with a world-wide reputation for dependability. Available in wire-wound, vitreous-enameled type; fixed (5 to 200 watts); and adjustable "Dividohm" (10 to 200 watts). Also "Little Devil" composition resistors (½, 1, and 2 watts in all RETMA resistances), plus many others for special and experimental uses.

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NATIONAL NC88 WORLDMASTER

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ELDICO TR-75TV TRANSMITTER KIT

Popular 60 watt CW transmitter. Includes anti-TVI features. Covers 80, 40, 20, 15, 11 and 10 meters. Pi-network output. 6AQ7 osc. 1625 final amp. Heavy power supply delivers 550V. Ideal for Novice work..... **$64.95**

50 WATT EXCITER-TRANSMITTER

Modern design includes features and shielding for TVI reduction. Bandswitching for 4-7-14-21-28 mega-cycle bands. Circuit metering. Conservatively rated for use either as a transmitter or exciter for high power PA stages. 5763 oscillator-buffer-multiplier and 6146 power amplifier. Rack mounted. No. 90801, less tubes ..... WRITE FOR PRICE

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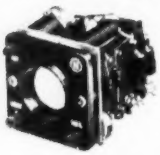

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No. 90901, with scope tube **$33.90**
As above, less scope tube **$21.00**

TECRAFT Crystal Controlled CASCODE CONVERTER

For 2 meter operation! Low noise and high sensitivity! 0.1 microvolt input gives signal 6 db over noise level. Highly stable CW or phone. 9 fixed tuned circuits. Power Required: 6.3V AC at 2.4 A; 150 to 250V DC at 38 to 50 MA. Converter **$42.50**
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news letters, that the Flamingo transmitter hunt was won by UUZ and MVR and his new loop had to be escorted (?), that K2BIF won the first certificate for working 5 net members on the 28-Mc. band, that the net put on a Christmas QSO Party for the kiddies with MVR in direct QSO with Santa, that IEH has a mechanical filter for his 75A-4 Collins, that SVN, PBS, IYT, and Mrs. LVV have been in and out of hospitals, and that AEK attended the RSGB affair in London. LFL is using a Collins 75A-2 and 32V-1 on all bands. St. Petersburg: New Club officials: WMC, UUN, VOZ, WME, EYI, and YUC. TJU says the Tropical Net handled 325 messages in December. LMT reports 309 for the Florida 'Phone Net for November. DVR says FX skeds are on 1815 when QSB is bad. IYT has to answer for boxing Command sets for a neat field unit. LMT is cool for any living room. Thanks for the pictures. EM, our SEC, reports a terrific AREC build-up in 1953. Traffic: W4PIF 3505, PZT 635, DVR 330, DRD 214, WS 148, LMT 59, QBR 49, ZIR 48, IYT 36, TJU 35, RWM 27, VIE 21, FKR 17, LFL 15, FWZ 12, TWR 9, LVV 2.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS W4RE — Acting SEC: NN, W4PLE, KL7 still is looking for Western Florida contacts. JM has been heard on 15 meters lately. NN is QRL e.d. work. BKZ has a new VFO. BYE and JPA are renewing tickets. NJH is QRL with K4FAR. WKQ is running 13 watts. Hi. VEY needs more grid drive on 10 meters. SWF and STW have left for California. SYP is recording TUNEs transmissions. ZWG and ØKVX/4 are operating from the same antennas. WKQ ran up over 100,000 points in the SS Contest. CPE is a new operator on mobile. RKH and VE3BGG are working for WAS. RZV and CCY handled Vicksburg traffic in FB style. GIQ0 is doing FB with 75-meter mobile. DAO now is operating DEF from his office. MS has received his iconoscope and the camera and is going ahead in leaps and bounds. BFD is trying 40 meters. AYS is keeping things hot over his way. WN4ZPN keeps 40-meter sked with his son in Oklahoma. ZFL is heard on 40-meter 'phone. YFL is keeping 20-meter 'phone hot. VEJ now has General Class license and is president of the Pensy High School Radio Club. MUX has 32V-1 going FB. BREV-4 has FB "V" beam on 20 meters. FDL is trying 75 meters again. AXP keeps the e.w. nets going. BOE and SZH are doing FB 75-meter mobile work. UCY has HRO-60 in the shack.

GEORGIA — SCM, James P. Born, jr., W4ZD — SEC: NS. PAM: LXE. RM: MTS. Nets: GCEN, 3995 kc. at 1900 EST Tue. and Thurs.; 0830 EST Sun. ATLCW, 7150 kc. 2100 EST Sun. State mobile and e.d. frequencies: 3995 and 29,600 kc. New officers of the Savannah Amateur Radio Club are ZL, pres.; JIW, vice-pres.; KPL, secy.-treas.; RHD, act. mgr. Mr. A. L. Budlong, IRED, was guest speaker at the Atlanta Radio Club's December meeting and Christmas party held at Mannay's Shanty Dec. 15th. Mr. Budlong gave a very interesting talk and the Club is looking forward to his return next year. ZL2BC was guest speaker at the Confederate Signal Corps Christmas Party Dec. 10th. Ron made a very interesting speech and showed color films and slides of hams and ham equipment, also points of interest in New Zealand. New officers of the Kennehoochee Amateur Radio Club, of Marietta, are UCW, pres.; VVN, vice-pres.; YMV, secy.; and UPG, treas. CAZ now is operating mobile on 3.85, 14, and 28 Mc. with a new TBS-50. VKK has moved to Cedartown. JWCX has moved to Cedartown from Massachusetts. WYB is recovering from a broken arm. AWO is active on all bands, e.w. BXV has a new Eldico TR75TV1 transmitter and is active on 7-Mc. e.w. Traffic: K4WAR 3185, W4USA 2443, K4WBP 779, W4POE 370, ZD 97, IMQ 70, KGP 69, MA 45, ZWT 45, OPE 28, MTS 26, YMV 20, OCG 19, CAZ 16, ZEF 16, AWO 1.

WEST INDIES — SCM, William Werner, KP4DJ — SECs: KP4HZ and KV4BD. EE renewed AREC membership. KV4BD returned from the States. PT has a new BC-610. Father Carl, KP4EE, is leaving for the States; Brother Jerry, now KP4YR, is at Ponce. Seventeen stations participated in the Dec. 7th e.d. drill setting up a station with emergency power at control center. TF received a new mike for Christmas but meets the N.C. Net nightly on 3605 kc. AREC received a letter of thanks from Red Cross Washington Headquarters for work in the S.E.T. W3BGF visited NCS KP4ID and attended a schnapsbar meeting. W4UJX visited Ponce. VH has a new QTH. TY is a new 3525-kc. station in Ponce. HU, KD, and KF are receiving certificates for placing in the 3rd All-European DX Contest in 1949. JE is in fourth place. IY is trying to clamp modulate an 813. BV has a new 3550-kc. Net frequency crystal. PW has been appointed Asst. EC for San Juan. DV has 800-watt 'phone on 20 meters for schedule with his father-in-law in Caracas. Traffic (Dec.): KP4RC 9, DU 6, DV 6, UO 4. (Nov.) KV4BD 137.

CANAL ZONE — SCM, Nelson W. Magner, KZ5NM/W4QBS — RV was elected president of the CZARA. Other officers are JD, vice-pres.; AE, secy.; EC, treas.; MJ, act. mgr. NM was elected president of the Crossroads ARC. Other officers are IA, vice-pres.; WIYTM, secy.; QA, treas.; DE, act. mgr. OG is the first KZ5 to receive the Maritime Mobile certificate. WA is working Ws on 75-meter 'phone. BK operates CARC station KZ5PA daily on 20-meter e.w. SM5KP and his XYL visited the Canal Zone and were shown around by WZ. Ex-KZ5ML spent the holidays with

(Continued on page 96)

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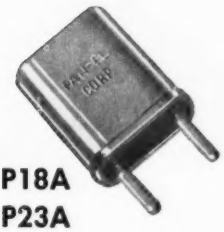
what the radio amateur means to the community when disaster wipes out the wires. Then above all times, communication is vital to thousands of lives, and only the faithful amateur at his transmitter — fixed or mobile — can get the message through . . .

Ask the Armed Forces

what Pan-El integrity has meant through two wars. Pan-El Quartz Control Crystals are on frequency and stay that way because our engineers have developed a special process to give Pan-El Crystals long-term stability.



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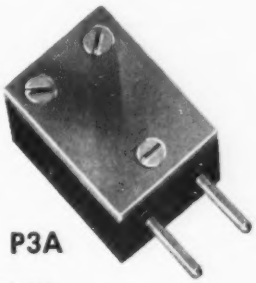
P23A

Full range of amateur frequencies. P18A and P23A holders have .09 pins, spaced .486 inch to fit FT-243 sockets; are silver-plated, hermetically sealed, filled with dry nitrogen.



P3A

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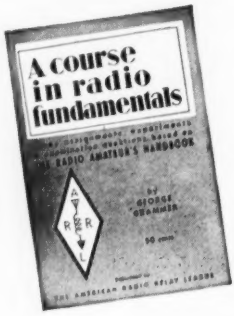

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RM, KA, and family. DF9AA and CE2GW also visited the Canal Zone. Your support is requested in keeping the SCM informed by monthly reports, with items of interest for this column. Traffic: KZ5FL 81, NM 24.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — SEC: QJW. RMs: BHG and GJP. A surprise bit of news is the appointment as PAM to PIB. Smitty has agreed to remain in the post until CK can take it over after his move to the hills. Another surprise, but one which left me with chills, was the sad news of KYV and his cerebral hemorrhage of Dec. 27th. I learned about it by telephone from Dave who is indeed happy to be alive. Reason for the telephone call? Mrs. Kennedy, in the excitement, forgot to mail in the report to me. New associate member of the IRE, at long last, is YVJ. New members of LSN are TRF and USY. Sporting a 24-element 2-meter beam is ORS. The November F.M.T. shows that K6FA, W6RW, CBO, and YVJ qualify as Class 1 Observers. Our RM, BHG, is working on the swing shift again now that the strike has been settled. WRT, of the YLRC, came through with the dope that Gilda, KER, is president and PCO is second delegate to the L.A. Council of Radio Clubs. All licensed YLs are invited to regular meetings of the WLRC the 2nd Sat. of each month at 12:30, besides the YL net on 3885 kc. Mon. at 2 P.M. EGW, an OES, tells of the Temple City simulated emergency drill performed in Area B, District 5, and he points out that preparations for it were made during December. K6BLI, new here from Oakland, is looking for c.d. work. ISQ activities will be slightly curtailed with the recent arrival of a new jr. operator. QVN sent in a lot of juicy stuff including the Fish Net "wing ding" held in December with QJW, RFX, TDW, VBN, MDX, EKI, FSE, BAY, and QVN attending. MDX will be warm when he moves to W7-land. Ex-W6VIG/KH6ACK now operates from KX6BH on 7-Mc. 'phone and c.w. DMK took over the Golden State Net during January. FSE and QJW did a fine job getting a doctor to a sick ham in 29 Palms through heavy 3.9-Mc. QRM. VUY became a new papa in December. EBB worked LB8YB the hard way on 7 Mc. HPV tells me that he is moving to Dallas and will continue to do OO work there. KN6BVW, of the U. S. Navy, wants to compete with our c.w. net on the Novice band. He teaches Navy strikers to take faster c.w. After a visit to the Inglewood Club, and the den of half of the LACRC, 5 dishes for 3-CM. band were taken away. Looks like the radar bug has bitten. Traffic: (Dec.) W6KYV 4660, HLZ 668, BHG 482, LYG 343, K6BWD 340, W6LDR 218, FMG 166, GJP 152, JQB 113, ISQ 108, USY 76, MBA 36, MBW 27, OKD 24, CMN 21, CBO 15, ORS 15, PZN 13, NJU 12, HIF 10, AM 8, YVJ 6, GEB 3. (Nov.) K6FCY 1154, BWD 92 W6UGA 64, TRF 11, COZ 2.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. RM: QFQ. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 P.M. 3865 kc. Arizona C.W. Net: Nightly 8 P.M. 3515 kc. Arizona Novice Net: Tue. and Thurs. 6 P.M. 3704 kc. The outstanding event of December was the emergency test staged for the members of the Arizona Legislature. The purpose of this was to demonstrate amateur radio for the proposed license bill. There were 156 stations, including 51 mobiles and 10 walkie-talkies. IRX and JYH were in charge. AARC had a bang-up ARRL educational meeting at which Director Griggs and Vice-Director Joos and state officials gave talks on the national, sectional, and state aspects of ARRL. An Etched Circuitry illustrated talk was given before the OPRC. JT has a new 6-meter GP. MOF, ROZ, and USX are now 75-meter mobile. NDJ now is on 75-meter 'phone. KWB and NAP are now on teletype. PKM, PUD, QNO, SUI, and TAF are working up a 2-meter net. IRX has a new 40-meter doublet. ACD now is portable in Phoenix. K6AOQ has moved to Mesa. CPY, Northwestern Division Director, is wintering in Mesa. 6JMQ moved to Bisbee. 4ZJE moved to Benson. New calls: VAG and VAX. Traffic: W7QFQ 169, LAD 115, KOY 96, LVR 45, IRX 10, NRZ 6.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: VFT. Asst. SECs: FOP, WYA. ECs: KUU, FJH, QJH, HRI, DEY. PAM: JPM. The Hobo Net on 3570 kc. is very active handling traffic each evening. New officers of the Helix Club are GHT, pres.; IZS, vice-pres.; GMT, secy.-treas. The 10-meter AREC Net, meeting at 1900 Tue. nights on 29,500 kc., has over 30 active members. WN6UQF, in Escondido, now is W6UQF. Escondido High School has five new Novices. SHY has a new Viking II. IKV now is active on 40 and 80 meters at Dana Junior High with TCS. LPB has a new kw. rig on in Indio. YXU is back with low power on 75 meters. OAJ has a new QTH. Ex-VP9AL now is K6AQO. K6BTO is active in National City on 146.9 Mc. New officers of the Orange County Club are UFP, pres.; OZO, vice-pres.; BVI, secy.-treas. DEY now is Asst. Radio Officer for Orange County for c.d. The Orange County Club has a call, K6DKF. The Club had a c.d. drill which was a success. PEJ lost his tower recently in a big wind. OZO, DKN, ZE, VAD, and DEY are active on 420 Mc. in Orange

(Continued on page 98)

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County. KN6DBG now is K6DBG. K6AAG now is mobile on 2 meters. RKL has a new Viking II hooked on his "V" beam. PAN is resting at home after a spell in the hospital. VOP is active again after moving. San Diego Area Clubs now are meeting in the Red Cross Building with excellent facilities. The Orange County Club now has half a quonset hut at the communications center which they are equipping. Traffic: (Dec.) W6IAB 9194, ELQ 1362, QJH 654, IZG 610, QGU 228, SK 30, FCT 9, LRU 4, DEY 1. (Nov.) W6IZG 122. (Oct.) W6IAB 3477.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — JXW conducted an interesting amateur TV demonstration before the Ventura County Amateur Radio Club. FYW reports the anticipated curtailment of his radio activities until completion of his new home. K6NBI is presently the section's most active traffic station. K6AUZ and K6ASB are on SBN. All radio amateurs in Santa Barbara, Ventura, and San Luis Obispo Counties are invited to report their monthly activities to the SCM. A post card mailed to me on the first of the month will do the trick. Traffic: K6NBI 155, W6FYW 20, K6ASB 12, AUZ 2.

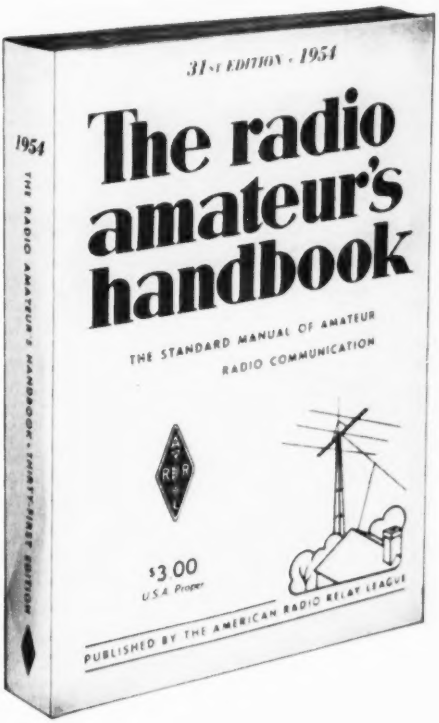
WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAM: IWQ. RMs: PCN, QHI. Dec. 2nd found the following Amarillo amateurs joining in a search for an Air Force captain who parachuted into rough ranch country near Amarillo: SFW, MYH, RRA, DCM, WB, CWE, K5FCG, W5PCN, JD, IGU, and UBW. LPI is Net Control on 29-Mc. Net in Amarillo. VIM reports new 40-meter two half-wave in phase antenna with broadside to Australia and South Africa. The Dallas Amateur Radio Club held its regular meeting Jan. 5th. TCD and his XYL, UUS, are moving to Chicago. YUK, NCS for Fort Worth 10-meter emergency net, reports a hidden transmitter hunt is held almost every Sunday, with RHW and QFN being the first to find it. THI was a recent operator of the hidden transmitter in a child's little red wagon. MOP found it on foot. URI is charged with getting out the Fort Worth Kilocycle Club bulletin monthly. QZS is experimenting with a ground plane on 10 meters in Fort Worth. LIF has a new HT-20. MOP is building 250-watt mobile. KVA has high-power mobile. RRM is going all-band mobile. FIR is Official Bulletin Station. UDI and TDA are new on 10-meter mobile. LTY has moved to San Antonio. TND has cubical quad on 10 meters. HCA has a kilowatt on all bands. PTL assisted a blind boy in getting his Novice Class ticket. The Fort Worth Kilocycle Club has applied for the call W5HD. VYY received a Lysco VFO for Christmas. LZV has new 60-watt mobile rig. Rose, ex-9SPN, is now 5BDB in Dallas. Traffic: K5FFB 533, W5UVC 504, TFB 332, UBW 219, PAK 170, UFP 118, GER 70, KPB 35, VHF 34 CF 27, RRM 22, RDG 12, AWT 6, SFA 6, BFK5, ZOK 2.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: CKQ. RM: MQI. PAMs: SVR and ROZ. The annual hamfest and Christmas dinner of the Enid Amateur Radio Club was held Dec. 27th. CCV has a new Viking. KY reports 62 AREC members in Tulsa County. The Aeronautical Center Radio Club held its annual Christmas party Dec. 24th. EHC now is using a 12-watt rig for local contacts to avoid QRM caused by the big rig. VAX is attending radio-TV school in the City. The Oklahoma MARS is growing fast with the help of the gang at Fort Sill and Lawton. YNA, WZV, YZB, and 9STE. The Lawton-Ft. Sill Radio Club held its annual winter hamfest on Feb. 14th, followed by a dinner. RST has been elected to the office of SCM as of Feb. 15th. Monthly reports should now be sent to him. Out of 1200 amateurs in the State we should have more than 20 or 25 stations reporting their station activities to their SCM so, gang, let Doc hear from all of you. The NTO Net reports that 890 stations checked in with 518 messages handled during December. They operate on 3960 kc. at 1730 every day so provide an excellent outlet for your traffic. Traffic: (Dec.) W5MQI 170, SWJ 127, GVS 103, MRK 90, KY 74, ADC 70, YQO 44, MFX 41, GVV 37, EHC 36, VAX 27, OQD 15, RST 13, PNG 3, VBG 3. (Nov.) W5MRK 90.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — BQU sent a full report on the splendid work of El Paso hams in the recent B-36 crash emergency. Your SCM attended the recent Austin Amateur Radio Club annual banquet. New officers of the Club are FXN, pres.; AXY, vice-pres.; QZZ, secy.; ANQ, treas.; PRO, act. mgr. QDX, outgoing president, was awarded $25 by KA on behalf of the Hargis Co. for being the outstanding ham in the AARC. AXY reports a lot of 10-meter mobile emergency activity in Austin. AXY operates 75-meter mobile when he comes to Houston. Lt. Col. U. U. Woodward, RKE, suggests changing from XYL to MYL (married YL). The new editor of *Stenscope* is OMP. I was invited to the Zone 1 picnic in Woodsboro with EYV in charge and we had an FB transmitter hunt. Bob had the Texas State Guard radio bus there. FJF is going to town with his ART-13 mobile and 24V system and is building a kw. FXN received 150 DXCC sticker. He is building a ½-kw. 144-Mc. rig. RPW is pres. of HARC with LSE, vice-pres.; FEK, treas.; VBW, secy.; KFY, parliamentarian; NMG, program chairman. The

(Continued on page 100)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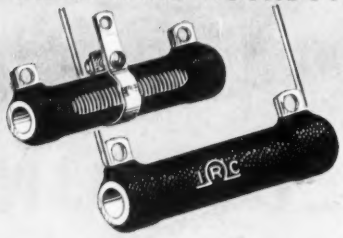

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Houston 75-meter Mobile Dragnet recently had a nice get-together arranged by CE. The Port Arthur ARC is very active and is working with C.A.P. BCE and YFC now have General Class licenses. WN5BLR now has 26 states. WPL recently worked KV4AA to make 14 countries. TEH worked PA, DL4, G, and KL7 on 80 meters. TEH is pres.; WPL, vice-pres.; UTR, secy. and editor of *The Monitor*. NNF has a new Viking II. WN5AOQ has Heathkit AT-1 and SX28-A. BCF is mobile on 3855 kc. CCT got a link from OPJ and has it on 3855 kc. Officers of the El Paso ARC are RUN, pres.; JOT, vice-pres.; QVJ, secy.; NAI, treas. The EPARC has completed its club house. PDK is en route to the Far East. AFS, one of the first operators in E.P., has passed away. AOT, PKN, QZC, and MDA have returned to E.P. YWF gave his wife, ZOQ, a mobile for Christmas. FND's XYL is doing an FB job as editor of SARC *Gutter Dope*. The ladies' auxiliary holds regular meetings. GKX is a new mobile operator. WN5AJE is on 3726 kc. 24 hours a day. Ben Cochran is NCS for SA Emergency Net. HHO and LVE have been appointed to take care of Field Day activities. At a recent SARC transmitter hunt LVE was first, THU second, and HHO third. FZA won the yearly plaque. EDX, THU, WXT, KQG, and GKI took photos at the Christmas party and HHL made a recording. ONS, who is active on 144 and 432 Mc., has a de luxe antenna farm. ULN, secretary-treasurer of GCARC, reports: JRV is custodian of the club station. BGR is doing FB on mobile with Harvey-Wells. JRV is on 15, 75, and 160 meters. ULN has a new rig which works FB. OGG is mobile on 75 meters. VUS still is active on 75 meters and is plate-modulating his 813. ULW is conducting code classes. YBL is working on 813. Traffic: W5MN 3126, FJF 32.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYI. PAM: BIW. RM: NKG. SQI is a new ORS and OPS. FPB, NCS of Albuquerque V.H.F. Net, reports regular members are FAG, FJE, FPB, RFF, RQK, OLN, and VWU. In 1953 the following reported into the Net: BNR, CA, CFJ, HGV, HJ, LFH, LQW, NRX, NXF, PQA, QJN, UEO, and WGF. Also KCW and NFU, of Santa Fe, and MYQ, of Los Alamos, were contacted. FMM says 522 will be installed atop Sandia Crest at the TV building to attempt direct contacts with Portales and Amarillo. FAG is mobile on 2 meters. CTG, DAH, LQW, PQA, and RUV were on 430 Mc. last year. New ones on, or building, are FAG, FJE, GSA, IFF, LKX, QFJ, UXT, WQS, and ZFS. CA reports the West Gulf Division again will sponsor the V.H.F. Award for 1953. The Walker AFB ARC soon will be on the air with a 610 and 452. Theory and code classes were started Jan. 18th at Walker. TXC has a new Harvey-Wells. YWG operated portable at Walsh, Colo., during the holidays. MYI, our SEC, has covered 13 miles with 6-meter transceiver, and other Santa Fe hams are building handy-talkies for c.d. KDX is the new president of the Tularosa Valley ARC. FEF made BPL. RFF claims high in New Mexico V.H.F. SS. ZET has a new Viking II kit and VFO. Traffic: K5FEF 1119, NRX 375, W5NKG 191, ZUV 49, WPA 33, ZU 29, K5FAB 23, W5WBC 23, CEE 15, BIW 13, JZT 13, YWG 12, ZGG 9, NUN 8, SQI 8, VNZ 7, ZSL 5, WIY 2, YPC 1, ZM 1.

CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. EC: EK. RM: OM. High traffic man this month is VO6U, with an all-time high of 531. FQ makes an excellent total of 334, practically all of which is "VE8" and 'phone-patch work on 14-Mc. 'phone. Glad to hear XR back on after a long absence because of illness. IE also is recovering from a session in the hospital. We hear that VX is on his way back East from VE3-Land, and ex-VE1UC now is at Camp Borden, also drifting eastward. ES reports he lost his antenna in a storm but it is now back up. DB has been giving 21 Mc. a workout on week ends, both 'phone and c.w. and says it is a good band. The Maritime 'Phone Net, which meets daily at 7 P.M. AST on 3750 kc., continues to move good quantities of traffic although conditions continue poor for the most part. FQ got a nice write-up in the local press for Arctic contacts, after making the U.S.A. papers. Many thanks to all who took part in our recent Provincial C.D. test run. Traffic: (Dec.) VO6U 531, VE1FQ 334, AAW 112, OC 58, ZM 38, BL 31, OM 12, DB 5. (Nov.) VE1OM 10.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — The Wireless Association of Ontario, together with several Toronto clubs, were hosts to George Hart, National Emergency Coördinator of ARRL. Following a session around the festive board, some 80 hams assembled in the spacious auditorium of the Canadian Westinghouse Co. and listened to a very informal talk on problems dealing with Amateur Radio Emergency Corps work. Mr. Hart spoke of his visit to Montreal and Ottawa and was highly impressed with the hospitality extended him by everyone on this, his first VE-Land visit. May we extend congrats to all members of this section participating in the October CD Party. AVS headed the c.w. list with 30,660 points. While it is known that many groups gathered together to close out the year your scribe received material from only one source, that being the Hamilton Amateur Radio Club, which had a fine turnout at Oakville. Some 46 were present from Niagara Peninsula points, Toronto and district, Collingwood, and Hamilton.

(*Continued on page 102*)

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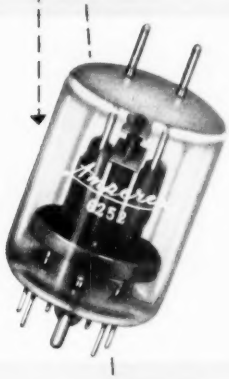

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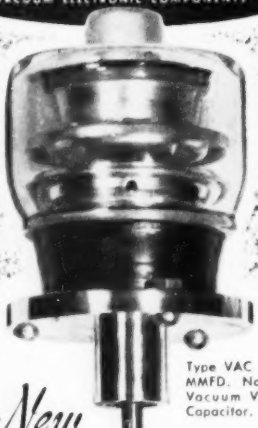

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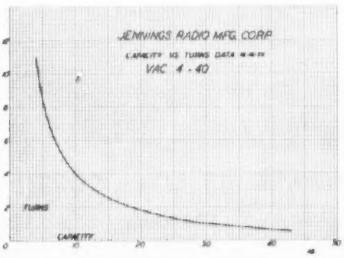

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Music was furnished by WT, JU, and KM. AVS and DFE proudly display 20-w.p.m. stickers. It's congrats again to the Hamilton Amateur Radio Club on being the top scorer for Canada in the 1953 annual ARRL Field Day contest. BSW hopes to snag a VK one of these early mornings. CBR now is attending school in Belleville. AOE is a recent ORS appointee and is doing a nice NCS job on the Ontario Section Net. Net operation in the section has been very difficult of late, because of skip conditions which seem to hold off until net time. How about some reports, OMs? Traffic: VE3ATR 246, BUR 242, NG 114, IA 108, EAM 100, AJR 84, AUU 28, AOE 21, WY 17, DQA 16, KM 15.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — SEC: BR. RZ is operating 70 watts to a 6146 on 80-meter c.w. from Quebec City. QA has an HT-18 rig on the air, after a lay-off of 20 years, and is considering a high-power amplifier for it. DR continues active with PQN, and advises that the frequency has been changed to 3670 kc. because of QRM caused by long skip on the other frequency. BG reports most of his activity is ragchewing, and that many of the South Shore gang have fallen to watching their peek-a-boo boxes! He also reports that HV and DR have formed a Utility Companies Net which meets Sat. at 1 P.M. and Sun. at 10 A.M. on 3780 kc. EC reports for the St. Maurice Valley gang and remarks that LE, ACS, and AME are referred to as the St. Maurice Valley Trio at Laval University, Quebec, from which place they now are operating. ATQ, RE, and LM are regular reporters into PQN. CA makes BPL and reports the biggest traffic month in the history of that station. Traffic was mostly for Eskimos at Pare Savard Hospital to their homes in the Northland. Traffic: VE2DR 208, CA 182, EC 56, BG 25, GL 18.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — We are pleased to report that LZ, who underwent a serious operation, is much improved. Alvin still is in Calgary General Hospital. HC now has Signal Shifter. PE has his eye on a Viking II. LQ has his grid-dipper completed. DO has completed a new VFO unit which works FB. ZR and MJ have had antenna trouble. Seems we get some high winds in Alberta — or could it be they don't live right? PP has acquired a new VFO unit. CP has been heard operating the University station. RR. WC has his eye on making BPL. WO and CE have mobiles ready to go. We hear that GW has acquired considerable surplus gear. KH and family have returned from a visit to Medicine Hat. KG has been bitten by the hi-fi bug. EH is instructing a square-dancing group. Traffic: VE6HM 98, WC 33, OD 17, MJ 10.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — This month's report is going to be short. I received the report from the Island correspondent (on time as usual) and two activity reports. There is no use making up stuff to put in print so that is why the written report is short. To find out what is going on around British Columbia one can listen to the stations on 75 meters. Lots of expounding there, but for this *QST* column we have to have some writing and letting us know. It takes but a little effort to sit down and write a letter so we can put in print all the news and traffic and organization plans. Let's hear from all of you next month.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — While spending Christmas on the Coast HR visited with ex-5DW, now VE7ABQ. Jack and Audrey send their 73 to all their old friends. WW visited Weyburn. QL sold his transmitter and will be heard with a Viking II anytime now. DA and BG are heard on 20-meter c.w. LB received a nice write-up in the local newspaper. W5JLA visited the Saskatoon Club while in the city on business. There are a number of appointees who need their certificates endorsed. If yours is one, please send it in or your appointment is subject to cancellation. Traffic: VE5PJ 19, HR 10.

Strays

W0FFC served as "mayor" of St. Louis on Boy Scout Citizenship Day, February 8th.

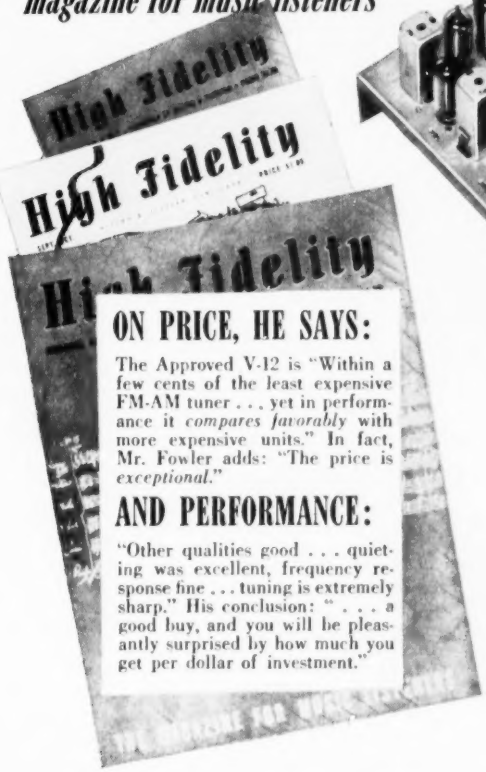
A 16-year-old Eagle Scout, Gerald was chosen for the honorary post in a "city election" held by the St. Louis Scout Council.

—···—

"Captain Stay-Put" is still getting around. When W2ZXM/MM put *Flying Enterprise II* into the Port of Philadelphia recently, a delegation of Philly mobile hams — W3s MYL, STC and VOC included — were asked aboard and a fine time was had by all. Kurt still gets a chance to sign his KZ5HC call now and then.

"You will be pleasantly surprised..."

says High-Fidelity Magazine editor Charles Fowler reporting on the Approved V-12 tuner in the famous "magazine for music listeners"



ON PRICE, HE SAYS:

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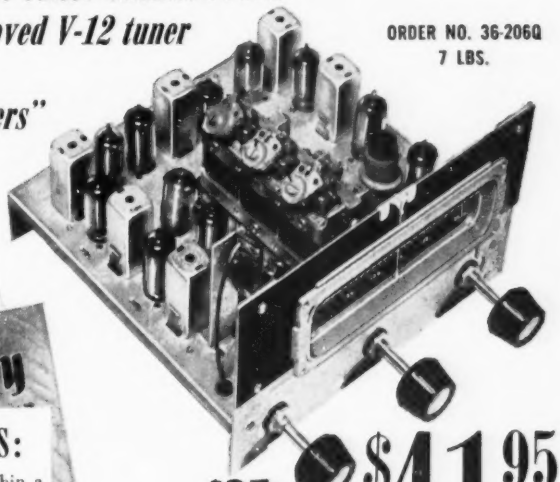

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Thank you, Mr. Fowler!

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20-Meter Beam

(Continued from page 25)

Rotator and Indicator

Fig. 4 is a sketch of the rotating mechanism and direction indicator. A motor with suitable gear reduction, mounted on a shelf, drives a vertical shaft carrying a pair of pulleys. The upper one drives a similar pulley on the rotating pipe mast through a slot in the wall of the house. The pulleys should be at least 5 inches in diameter. Pipe clamps serve as bearings for this shaft, and the lower end of the shaft rides on a metal plate. An arm clamped to the shaft operates a pair of microswitches to limit the rotation to 360 degrees.

The direction indicator is a simple device. A wire fastened to the rotating pipe, with a couple of turns around the pipe, rides over a pulley on the shaft of a surplus synchro. The inside end of the wire is weighted. The synchro pulley should have the same diameter as the pipe.

While I doubt that many will want to duplicate this installation in every detail, I hope that some of the ideas presented will be useful to those who don't have the facilities or means to put up something more elaborate. While a roof-top two-element beam may not look too impressive, I have been well satisfied with the performance of this one over a period of several years. The same constructional ideas may, of course, be applied to a 10-meter beam.

21-Mc. Converter

(Continued from page 81)

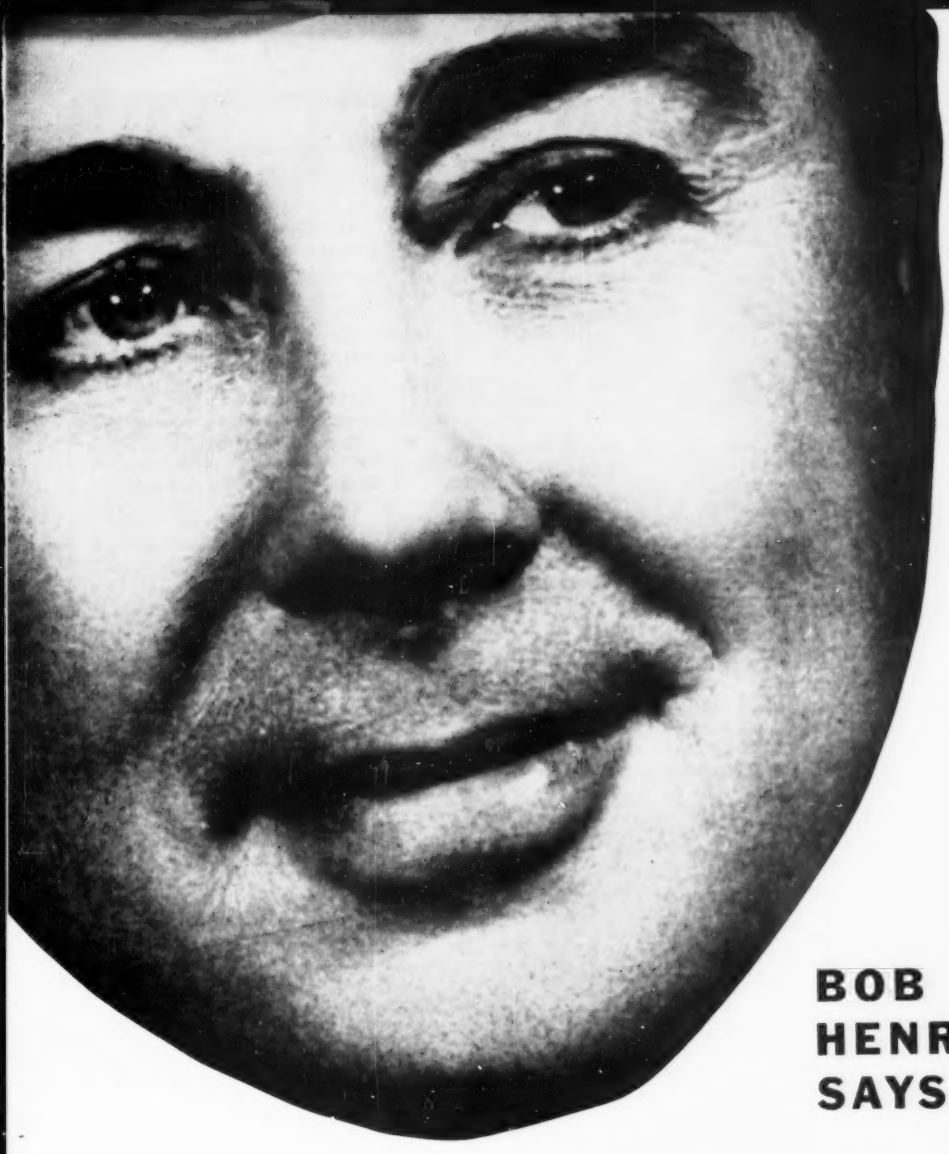
however. The writer's first attempt landed on 24.5 Mc., the 7th overtone. Current drain of the oscillator is about 3 ma. at 150 volts.

Next, the mixer is activated. Connect the converter output to the receiver antenna terminals through the coaxial cable and apply plate voltage to both mixer and oscillator. Peak the mixer plate and grid circuits for maximum receiver noise, with the receiver set at about 3.7 Mc. This may be done with a received signal on about 21.2 Mc., if some form of signal generator is available.

Now apply plate and screen voltage to the r.f. stage. Connect a 300-ohm resistor across the antenna terminals to provide a load, and peak the r.f. grid and plate circuits for maximum receiver noise or maximum response to the 21.2-Mc. test signal. Measure the current drawn by the entire converter. It should be about 8 to 10 ma., and it should not vary as the r.f. grid, r.f. plate or mixer grid circuits are tuned. If there is a marked fluctuation in current, the r.f. stage is oscillating.

In case r.f. oscillation is encountered, vary the setting of the neutralizing capacitor, tuning the input circuit for signs of oscillation. Make this test first with the 300-ohm resistor across the antenna terminals, and then repeat it with the antenna connected to the converter. Precise neutralization is not important. If the r.f. stage

(Continued on page 106)



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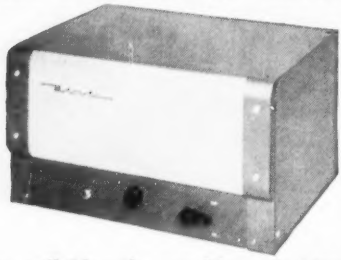

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is stable with the antenna connected, that is all that is necessary.

Should it be impossible to stabilize the amplifier, try different values for the by-pass condenser at the cold end of the r.f. input circuit. Lower values increase the feed-back and will require a lower setting of C_2. Higher values of by-pass capacitance will require more at C_2.

The injection coupling shown in the schematic diagram (loops L_8 and L_9, and their connecting link) may not be required, as there is considerable coupling between the coils themselves without it. The converter can be adjusted without the added coupling, and then it can be installed temporarily to see if any improvement results. Gain may suffer if the coupling is inadequate, but this may not be harmful where the receiver gain at 3.5 Mc. is high. It is unlikely that the coupling will be so low as to affect the signal-to-noise ratio appreciably. Excessive coupling may increase the tendency to spurious responses.

When the amplifier is operating stably with the antenna connected, all that remains is a final check for uniform response across the band. The r.f. grid circuit should be peaked at the approximate middle of the band. Then the r.f. plate, mixer grid and mixer plate circuits can be trimmed at opposite ends of the band to assure uniform response. Completely-uniform response may never be possible, because of antenna characteristics, but a slight readjustment of the three above adjustments should allow a reasonably close approximation.

Performance

When the converter is placed in service it may seem "noisy" by comparison with other 21-Mc. receiving systems. This is because of its high gain, which makes the noise picked up by the antenna stand out in marked contrast to the dead characteristics exhibited by many communications receivers at this frequency. Make a few comparisons, and you'll see that the 21-Mc. signals stand out far more. Unless your communications receiver is a very good one, the chances are that the converter will give you a wholly new conception of the possibilities of the 21-Mc. band. It may turn out that the band is not "dead" half as much as you thought!

Quist Quiz

Our friend **A** is rather proud of his code-copying ability, and his 35-w.p.m. certificate occupies a prominent spot on the shack wall. When his heckler friend **B** offers to bet $5 that **A** can't copy three transmissions of perfect code that **B** will send with a hand key, **A** accepts the wager with alacrity and a waving greenback. But **B** pockets the fin, and **A** admits that the bet was a fair one. What did **B** send?

(*Please turn to page 122 for the answer*)

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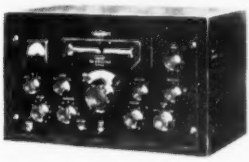

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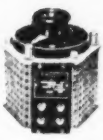

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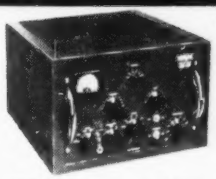

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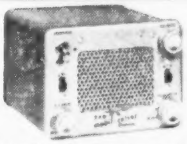

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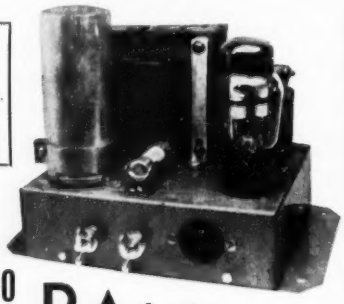

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"De Luxe" Break-In

(Continued from page 38)

formers used to obtain this 15 volts were poor-regulation 6.3-volt transformers, easily obtainable. The 20-ohm resistor across their output is just to load them down a little, as their output voltage was a bit higher than desired.

The physical construction of the control unit, with the exceptions previously mentioned, is not at all critical. About the only point to keep in mind is that under some conditions the circuit is nothing but a high-gain audio amplifier, so an attempt should be made to keep noise and hum out of the first stages.

A supply that will furnish all three required supply voltages for the control unit from one power transformer is shown in Fig. 2. It is necessary to adjust the voltages fairly accurately,

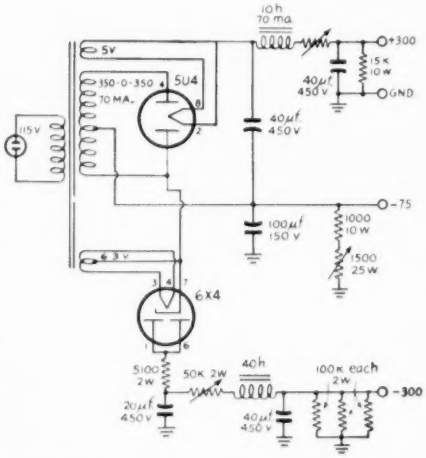

Fig. 2 — Suggested power supply for the break-in system.

say within 5 per cent, if the circuit is to work correctly. This is a little tricky with the circuit shown, as the adjustments are all interdependent. It can be done, though.

Performance Notes

Generally speaking, the unit has performed beautifully. Two figures may be of interest. Attenuation through the coupling stage (the 6AJ4) is nominally zero when the key is up. The actual value is dependent on the receiver input impedance, unity gain occurring at about 100 ohms. There may actually be some gain for high input impedance receivers.

There is some leakage through the stage when the key is closed, primarily through the plate-cathode capacitance of the 6AJ4, and therefore worst at the highest frequency in use (30 Mc. in this case). The attenuation has been measured on a particular unit as 60 db. in the 10-meter band, a figure that is more than adequate.

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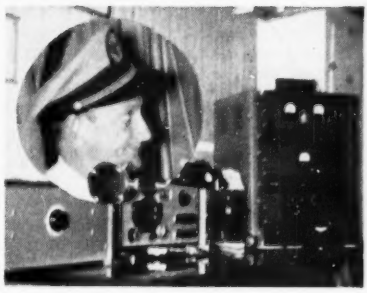

Capt. Bill Johnson, W2UKS says:
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CAPT. BILL JOHNSON, W2UKS
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GLOBE KING XMTR

TVI SCREENED CABINET NOW STANDARD EQPT.

$51.50 Cash Down

$495.00 KIT FORM — 12 Payments of $40.95

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Complete Band Switching

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(50 Watts CW—40 Watts Phone)

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KIT FORM **$89.95**

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Complete bandswitching 160 thru 10M transmitter with combination pi-network antenna tuner which will work into any antenna. Three-stage modulator allows 100% modulation of final. Has complete power supply. XMTR housed in new special grey TVI screened cabinet. Ideal XMTR for the novice or experienced ham.

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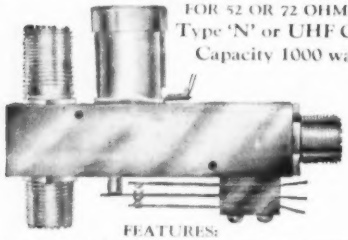
DOW CO-AX RELAY

FOR 52 OR 72 OHM LINE
Type 'N' or UHF Conn.
Capacity 1000 watts



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1. AC types entirely free of hum and are guaranteed equally as silent as DC.
2. Causes negligible change in SWR up to 100 MC.
3. Now available with type 'N' or UHF connectors.
4. Magnet coils entirely shielded.
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AC types (all voltages). Amateur net $10.50
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Add $1.00 for SPDT external switch.
Add $1.00 for special type receiver connector.

See your distributor, but if he has not yet stocked Dow co-ax relays order direct from factory. Send check, money order, or will ship C.O.D. Prices are net F.O.B. Warren, Minn. Dealer inquiries invited — literature on request.

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For details contact your nearest COMCO dealer

COMCO

Manufacturers of Radio and Electronic Equipment
COMMUNICATIONS COMPANY, INC
COCOA BEACH 34, FLORIDA

420-Mc. R. F. Amplifiers

(Continued from page 41)

tions leading to instability in such amplifiers wherein a universal double stub matching transformer was inserted between the amplifier and mixer. This showed conclusively the need for proper resistive loading. Oscillations resulted from any serious deviation from the specified range of loading.

Mixer tank circuits with oscillator circuits coupled to them often reflect large reactances back into the last r.f. amplifier plate circuit, causing oscillation. This will be noted as a series of birdies or plops in the receiver output occurring as the amplifier tank is tuned through its complete range. Considerable care should be taken with crystal mixers to assure proper loading of the output r.f. stage. One solution is to feed the crystal directly from the r.f. amplifier output, eliminating the extra mixer tank circuit. Oscillator injection can be moved to the i.f. side of the crystal in many cases to isolate the oscillator reactances.

For capacitive coupling, a 0.001-μf. disk ceramic condenser is tapped approximately 2⅝ inches from the plate end of the line. Heavier loading can be accomplished by moving the tap toward the tuning condenser and lighter loading by moving toward the B+ feed-point. In addition, changing the length of coax line running between the r.f. stage and the mixer may help as a means of matching impedances. Generally speaking, in case of oscillation trouble, concentrate on loading the last r.f. stage properly because any 6AN4 input impedance loads the preceding amplifier properly with any length coax line between.

No adjustments should be necessary after completion of the amplifier other than to apply voltages, plug in an antenna, attach to a 420-Mc. receiver, and tune the plate line to resonance. A broadly-tuning rise of from 2 to 4 db. in background noise will be noted for a properly loaded amplifier, if the gain of the r.f. stage or stages is enough to overcome the noise of the mixer alone. Any sharp rise in noise indicates instability and insufficient loading.

Due to the wide tuning range of the amplifier, it may be possible for it to tune to the oscillator frequency. This may result in a plop in the tuning; however, there will be only one such point in the tuning range of a stable amplifier.

The performance of the system may now be checked by making comparisons in reception of weak signals with and without the amplifier, or a noise generator may be used as described by Tilton.[2]

In either case, the degree of improvement to be found by the addition of the amplifier will be most gratifying.

The authors wish to thank the management of The Texas Company for permission to publish this article.

[2] Tilton, "Noise Generators — Their Uses and Limitations," *QST*, July, 1953, p. 10.

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Spring arrives officially this month — time to think of mobile operation or a new skywire — we can supply complete mobile installation or fixed station antennas — anything from a simple dipole to a multiple array for 10, 20 or 2 with rotators — call Uncle Dave, W2APF, he will help you.

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TRANSMITTER KIT

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In Stock for Immediate Delivery

New ELMAC TRANSMITTER AF-67
Trans-Citer

$177.00 Net

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All bands 120 w. CW. 100 w. phone

Switches to all six bands. TVI suppressed with 10 tubes.

SRT 120 Kit $159.50
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Hammarlund HQ 140X

Tunes .54-31 mc. in six bands; calibrated band spread; 9 tubes in RF and AF; full wave rectifier and voltage regulator; calibrated S meter; crystal filter; antenna compensation; AVC; new series-type noise limiter. Supplied furnished in two-tone gray.

$264.50

Matching Speaker $14.50

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½" x 1¼" — 13c ea.; 10 for $1.00
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25 mmfd. 25c ea.—5 for $1.00
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SWITCH, phenolic sec., 2 d., 3 p., 3 pos., NS. 29c ea. — 4 for $1.00

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Extra Special
DYNAMOTOR GN45B
6V in, 400 V 160 MA out. Complete with conversion dia. gram and brushes. Will go Parcel Post.
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Kit, complete with tubes less crystal, key and mike.
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GONSET COMMUNICATOR
2-Meter
Transmitter Receiver

Model 1026 $209.50
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Operates from either 115-Volt AC or 6-Volt DC source.

Mobile Special
NEW SHIPMENT
Hand mike, single button carbon. Complete with cord and plug. Finest made.
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Complete with 100 ft. 4 Cond. Control Cable

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Provides:

- HIGH SENSITIVITY — Sensitivity better than 1 microvolt. Gain approx. 30 db. Noise approx. 4 db.
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- USES: 6BZ7, 2 — 6C10, 2 — 6J6 tubes. COMPLETE with plugs, tubes and crystal $42.50
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Variable Inductance Coils

- High quality mica-filled form
- Two extra tiepoint terminals

PART NO.	NOMINAL INDUCTANCE RANGE (MICROHENRIES)
120-A	2-3
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95¢ each

F-120 low-loss, mica-filled coil forms, each with metal bushing, nut, lockwasher and four terminals. All metal parts plated. Use for circuits to over 100 mc. 65c each.

No C.O.D. Minimum order three coils or forms plus 25c postage.

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Douglaston 62, N. Y.

On the Air with S.S.B.

(Continued from page 34)

present this switch is mounted next to the 4D32 socket without an extra knob showing on the exterior of the cabinet. A piece of flexible shaft should eliminate this shortcoming.

"A bias of −50 volts seems best on the 4D32. This gives an idling plate current of 10 ma.

"Using the Viking in conjunction with my crystal filter s.s.b. exciter I have worked five W4s, three W5s, one W3 and two W8s in one evening on 160 meters! I believe I'm the only active s.s.b. ham on 160 — sure wish more hams would go s.s.b. on 160!"

(Although K6CRT uses the Viking this way only on 160, there's no good reason why it shouldn't work as well on 75. You might have to be just a little more careful about spurious radiations from oscillators, images, etc.)

'Scope Intensifier

If you don't read the *RSGB Bulletin* and thus get a chance to see G3CU's excellent column, "CQ Single Sideband," you will have missed the neat trick shown in Fig. 2.

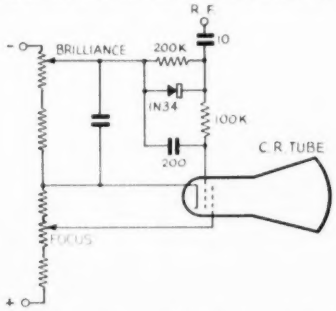

Fig. 2 — **By using rectified r.f. as an intensifier, G2IG monitors his s.s.b. transmitter without danger of burning a line on the 'scope face.**

It's a dodge for reducing the intensity of the 'scope trace when there is no signal, and thus reduce the chances for "burning" a line on the screen. It's easy with an a.m. rig, of course, where you're clunking on and off with all sorts of power supplies, and turning off the 'scope can be made part of that procedure, but with s.s.b. and break-in, the screen can go fast if you turn up the brightness high enough to do some good on peaks. However, as shown in Fig. 2, by adding a germanium rectifier and a few resistors, the 'scope will brighten up when r.f. is delivered to the antenna and dim out when none is forthcoming. The point marked "R.F." can be connected to the feeder or some convenient point where r.f. is being developed.

It is, of course, a simple thing to tie in your 'scope to your voice-controlled break-in circuit, but G2IG's system becomes self-powered and automatically adjusts itself to the proper level. G2IG reports that, in practice, the center quarter inch of vertical deflection is invisible, while the remaining deflection is easily visible but not bright enough to cause a burn.

Still More on Moving Crystal Frequencies

P. Essinger, HB9LA, who uses a crystal lattice filter s.s.b. exciter, reports that he tried several of the frequency-moving tricks on a filter crystal but found the best way to be the copper-sulphate method (this column, April and November, 1953). He confirms that the concentration of the solution is not important at all, and reports that his best results were had with a current of 0.7 ma. — *B. G.*

Strays

This oddity courtesy KP4RK: W3TUK and W5TUK, both first-named James, were assigned the calls KP4WU and KP4WW, respectively, at the same time.

PUZZLE PICTURE:

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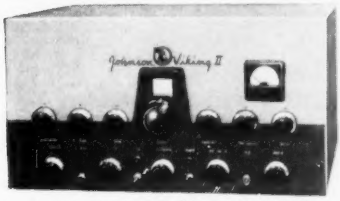
It's not hard to spot the many bargain-conscious customers who have taken advantage of our "Surprise" Trade-In policy on used test and communication equipment. For deep down satisfaction and real money-saving, get your trade-in deal working today. Wire, write, phone or use the handy coupon below.

NEW HALLICRAFTERS SX-71.
Less speaker. Net $249.95

COLLINS 75A-3 with 3 KC mechanical filter. Less speaker. Net $530.00



JOHNSON VIKING II TRANSMITTER
KIT. Net $279.50
JOHNSON VIKING II. WIRED
AND TESTED. Net $337.00

ELMAC AF-67 TRANSCITER. VFO or crystal controlled. Phone or CW transmitter, ideal for home or for under-dash mobile operation. Complete with tubes. Net $177.00

ELMAC MOBILE RECEIVER. Dual conversion, 10 tubes, BFO, noise limiter, covers all amateur bands 10 though 160 meters plus BC band.

Model PMR-6A	For 6 volts	Net $134.50
Model PMR-12A	For 12 volts	Net $134.50

NEW HALLICRAFTERS SX-88.
Dual conversion, high selectivity.
Less speaker. Net $595.00

MILLEN GRID DIP METER
Model 90651. Net $61.50

All prices f. o. b. St. Louis • Phone CHestnut 1125

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☐ Rush "Surprise" Trade-In offer on my _____
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(show make and model number of new equipment desired)

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Name _____

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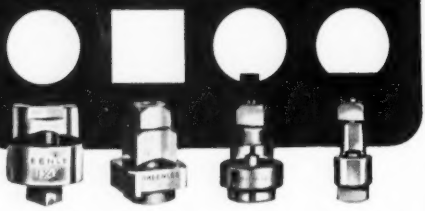
ROUND, SQUARE, KEY and "D" OPENINGS QUICKLY MADE
with Greenlee Radio Chassis Punches



Save hours of hard, tedious work . . . cut accurate holes in chassis for sockets, plugs, controls, meters, panel lights, etc. with GREENLEE Punches. In 1-1/2 minutes or less make a smooth hole in metal, bakelite or hard rubber up to 1/16" thick. Easy to operate. Simply turn with ordinary wrench. Wide range of sizes. Write for details. Greenlee Tool Co., 1863 Columbia Ave., Rockford, Ill.

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BE SAFE WITH
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CP

Tech Correspondence

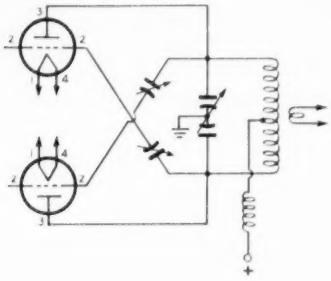
(Continued from page 43)

CIRCUIT DIAGRAMS

4921 Chestnut Ave.
Pennsauke, N. J.

Technical Editor, *QST*:

Read with interest the dissertation on circuit diagrams (January, 1954) and heartily agree, since one of my jobs when I was with Philco, 1928-1935, was to draw schematics, both for production and service bulletins. To meet the closing challenge in the article, I'm submitting the following:



. . . if, for clarification, you can split a dual triode, then you can carry the elements (grid in above) through the tube, if you put the same pin number on both exits.

— *Jack Dubas, K2CPR, ex-W3BXE*

March 1929

. . . This month there are editorial comments on Army-amateur affiliation, broadcast interference, and careless operating habits.

. . . In "Improving Short-Wave 'Phone Reception" Ross A. Hull describes the building of a modern 6-tube superheterodyne for efficient reception of code and voice.

. . . The second and concluding part of "The Design of Inductance Coils," by D. R. Clemons, discusses types of windings and tapped-coil applications.

. . . M. B. Sleeper, in "What Price Television?" states practical television will arrive only when scanning disks are gone and use of ultra-short wavelengths perfected.

. . . The Experimenters' Section gives space to discussion of audio filters, a junk-box trimmer condenser, a low-voltage detector circuit and signal monitors.

. . . A message from General George S. Gibbs, USA, highlights "The Army-Amateur Radio System is Revised," an article enumerating changes in Army-amateur liaison.

. . . "The Return of the Native," fiction by W5LS under the nom de plume "Felix," entertainingly combines the romance of college life with that of amateur radio.

. . . "IARU News" contains interesting reports on ham radio in such distant lands as Australia, British Isles, Holland, Japan, Spain and the U.S.S.R.

. . . In "The Communications Department" we find fresh news of ship stations WHDC, the *Nomad;* WSBC, the *Carnegie;* KFLF, the *Ripple;* and the Byrd expedition.

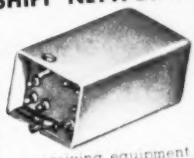
NEW!

MILLEN 50 WATT EXCITER—XMTR

Use as a transmitter or exciter for high power PA stages. Bandswitching for 4-7-14-21-28 mc bands. Circuit metering. 5763 oscillator-buffer-multiplier and 6146 power amplifier. Shielding for TVI reduction. Rack mounted. Less tubes.

Millen No. 90801 $75.00

MILLEN PHASE-SHIFT NETWORK



Two, laboratory aligned and adjusted, 90-degree phase-shift networks in a single, compact case. + 1.3 degrees over range of 225 to 2750 cycles. No readjustments necessary — unit is factory sealed. For use in SSB transmitting or receiving equipment. 40 db suppression of unwanted sideband in SSB xmtr. Permits building of SSB equipment without need of complicated lab equipment for network adjustment. Completely shielded can is 2x1-7/16 x4" and mounts like IF transformer. With schematic and mounting details.

MILLEN NO. 75012 $9.75

Keep TVI Voltages Inside Your Rig with

METEX ELECTRONIC WEATHERSTRIP

Here's the famous weatherstripping used in electronic equipment of combat planes to suppress RF leakage to less than 5 microvolts per meter! Made of resilient, compressible, knitted monel wire mesh (not woven or braided) and designed specifically for Ham applications (see August 1953 QST). Easy to install around xmtr panel louvers, rear opening and hinge side of lid. Packaged in 20-ft. lengths, 1/16" thick.

TYPE TVI-20-S $3.95

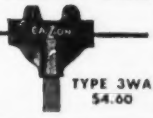
EAZON GROUND PLANE — COAXIAL ANTENNA JUNCTION

For use on any frequency. Above 140 mc, self-supporting stiff wire is FB as radiator and radials. Takes standard coax connector.

Type GP $2.95

Mounting Bracket for above 75¢

EAZON COAX CABLE CONNECTOR



Rugged, weatherproof, insulator and coaxial cable (RG 8/U or 11/U) junction for center of dipole antenna.

TYPE 3WA $4.60

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WEBSTER Bend-a-matic MOBILE ANTENNA

Now . . . mobile operation on 75-40-20-15-11-10 meter bands with one streamlined antenna! No external taps or projections. No plug-in coils! Band change is simple: merely raise or lower to factory calibrated markings that correspond to band selected. Loading inductor wound directly on upper portion of fiber glass support column, plastic covered. Weatherproof, lightweight, 9 ft. 9" fully extended, minimum height 63". Threaded 3/8-24 SAE mounting stud, ½" long (fits any mount with this thread). **Web-Whip** $29.50

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Professional quality equipment for the amateur who wants the best — from one of the country's leading Collins distributors.

75A-3 Receiver	$530.00
10" speaker for above	$20.00
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KW-1 Transmitter	$3850.00
800-cycle mechanical filter plug-in unit	$55.00
8R-1 plug-in crystal calibrator	$25.00
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MM2 SERIES

For Amateur, Police, Aircraft Fixed and Mobile Transmitters

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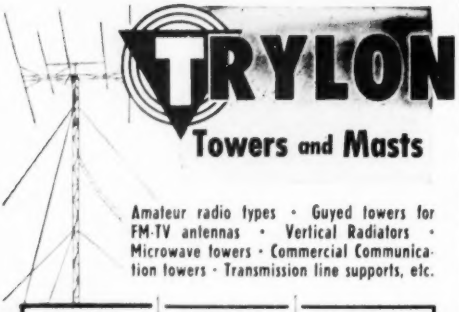

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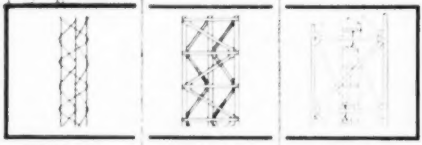

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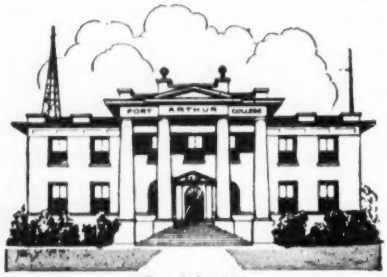

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YL News & Views

(Continued from page 50)

meter 'phone net Thursday at 2:00 P.M. EST — 14,210 kc.

The NYLONs (Northwest YL Operator Net) meet on 75-meter 'phone, 3820 kc., Wed. at 9:00 A.M. PST. W7QYN is NCS with W7JFB as alternate NCS.

December, '53, "YL News and Views" contained a complete YL net schedule.

—···—

It is always interesting to hear about YLs of other countries — to learn of their particular interests and activities in our hobby. Currently, there are ten YLs in Spain — some of whom are very active. EA2CQ, Paula Mendia of San Sebastian, is one.

Paula Mendia, EA2CQ.

Paula's special interest has been DX from the day she received her license in August, 1950. In two months she worked 100 countries on 'phone. She now has 185 confirmed, and her goal this year is to reach the 200 mark. She writes that she listens a lot — "This being the best way for hunting some rare DX. I am on the air from 0700 to 1000 and from 1490 to 1800 [GCT] daily." In the evening she lets her OM, EA2CA (the Consul for Costa Rica in San Sebastian), take over. Their station, as seen on page 65 of Dec., 1952, *QST*, needs little elaboration.

Paula relates that EA7EV, Maria, is hoping to make DXCC this year — she has worked 114 countries on 'phone, with 88 confirmed.

Besides Paula and Maria, the other active Spanish YLs are EAs 1EE, 1EW, 2DI, 3GE, 3IW, 4EA, 5EC and 5EL. They look forward to meeting us on the bands this year.

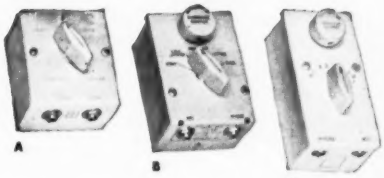
Keeping Up with the Girls

W2RTZ, Hope, has joined the growing group of ARRL Hq. YLs. . . . W1UET, Martha, has deserted the Green Mountains of Vermont for Venice, California; and W7KEU, Laura, has left Seattle for residence in Minnesota. . . . W6HHD, Teresa, has kept a daily sked for a year with her OM, who is with the Navy in the Aleutian Islands (operating KL7AIZ and KL7AZN). A couple of years ago they kept daily skeds for two years while Gil was in French Morocco (CN8EL). Teresa summarizes, "You can imagine just how much amateur radio means to us!" . . . Outgoing president W2EEO, Madeline, reports the new officers of the N. Y. C. YLRL — W2IQP, Lil, Pres.; W2IGA, Ruth, V.P; W2QGK, Sophie, Sec.; associate member Helen Zuparn, Treas. . . . VE6YW, Elsie, of Barrhead, Alberta, particularly enjoys contacting new hams and giving them a chance to get some c.w. practice. . . . W7SFR, Lorraine, writes: "W7PQW's (Jane's) family is almost a radio club in itself. There is Besse, W7UZJ (Jane's mother-in-law); Tom, W7KPC (Jane's OM); Jane, W7PQW; and harmonics James (14), WN7UZH; Beverly (13), W7UUM; and Elvin (12), W7UUI. Jane says operating privileges have to be rationed! Also, Tom's brothers are Joel, W6ZAB, and Lowell, W7KTC (whose XYL is W7LDH). The family name is Honey and it sounds like a honey of a ham family! Wonder if any other can beat this?". . . . W3QPQ, Jan,

(Continued on page 118)

LOOK STEINBERGS LOOK

JACK BOXES



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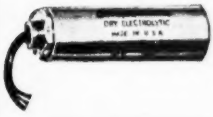

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is NCS on the Early Bird Net (3845 kc.) every morning, and she is NCS on the Transcontinental 'Phone Net every Saturday evening. . . . W6HRO is living in Bremerhaven, Germany, where her OM is stationed with the Navy. Helen has made a number of contacts on 20 'phone as DL4WO. . . . G3ACC, Margaret, should be credited with *116* countries confirmed and not 100 as listed in the Feb. YL-DXCC listing. Both Meg and G3GOX, Ann, reported on the RSGB Exhibition in London, which marked the first time so many YLs ever gathered together in England. "Assembled in a noisy corner were G2YL, Nell; G8LY, Constance; G3ACC, Meg; G3GYL, Nina; W4IWR, Hilda; G4YL, May; G3GOX, Ann; and G3IYL, Stella." YLRL Chairman for England and the Continent, G3GOX estimates about 53 licensed YLs in G-land. . . . YLRL Chairman for the Canal Zone, KZ5AE, lists the QRMary Club officers for the new term: KZ5KA, Kay, Pres.; KZ5AE, Sis, V.P.; and KZ5DW, Dorothy, Sec. Sis writes that KZ5s AC GQ and NN have deserted the Zone for W4-land, but one new YL is gained in KZ5PL, Pat. KZ5s CN DG and ML are very active on 15, and KZ5DG, Grace, is proud of her new Maritime Mobile Certificate. . . . W8HWX received YLCC #10. Lil reports that she and W8HUX, Marvel, will continue editing and publishing their monthly *Ham Shack Gossip* for about a year, until they use what funds and paper they have on hand. Lil and Marvel have kept the eighth call area well informed of local ham doings for the past five years. . . . With 141 contacts, W9MYC, Gladys, won the "Inter-LARK" contest held in November by the Ladies Amateur Radio Klub of Chicago. WN9YXK, Rita, won the Novice Class section. The contest was designed to get the girls on the air as much as possible for a week. The 25 LARK members plan other similar contests throughout the year. . . . The Women's Auxiliary of the Milwaukee Amateur Radio Club will hold its Fourth Annual Get-together of ninth call area YLs, nonlicensed girls and wives on May 21st–23rd. Headquarters will be the Medford Hotel and registration is $2.00. Write Committee Chairman Mary A. Meyer, Route 4, Box 568, Waukesha, Wis., for information. . . . W9MGT has organized a YLRL unit in Milwaukee. Officers elected at the first meeting in December are W9MGT, Lenore, Pres.; W9OMZ, Jeanne, 1st V.P.; WN9ZBA, Marion, 2nd V.P.; W9WYJ, Florence, Sec.; and W9QMA, Dorothy, Treas.

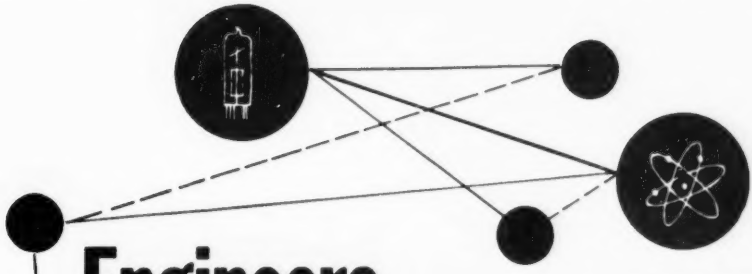
—···—

In the August, '52, column W7IHHH, Beatrice Austin, was presented as the 1952–1953 President of YLRL. Her duties completed in that capacity, Bea continues to serve the organization as Chairman of the Seventh District for the current term. Bea concentrates her activity on 75 and 20 'phone and is net control of the North West YLRL 75 'Phone Net. With QSLs from 210 YLs, she was one of the first to become a YLCC holder. Bea happily observes that YL activity in the seventh call area has increased considerably during the past year.

—···—

W8EIR, Alvine (Kate) Eastman, of Ossineke, Michigan, is the YLRL Chairman for the 8th District. The XYL of

W8UGD, Kate has been licensed since 1947. At present she is on 75 and 40, running 400 watts to a 5D21 in the final. Like all other YLRL chairmen, Kate invites the members in her call area to forward news regularly for *Harmonics*.



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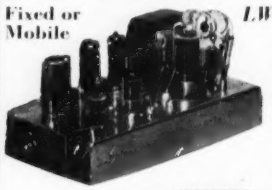

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How's DX?

(Continued from page 54)

has been popping up on 20 with 50 watts, a 40-meter dipole and a six-tube receiver . . . . . SP1KAA regularly pokes through on 20 c.w. with a 100-watt 5-stager, a 10-tube super and dipole radiator . . . . . Yugoslav Radio Club Kreka is frequently represented by YU4BMN on 7 Mc. with a 2-stage c.c.o. rig running 25 watts, a half-wave skyhook and four-tube superhet . . . . . REF (France), USKA (Switzerland) and UBA (Belgium) societies will sponsor a joint DX activity with the purpose of expediting results for those seeking H-22. UBA and DUF/DPF awards. Watch for a flock of HBs, ONs and Fs on March 6th-7th, the 'phone period, and April 3rd-4th, c.w. Six-letter serials will be sent and solicited, these to consist of RST (or RSM) and QSO number — 469001, 379002, etc. . . . . March 20th, 1500 GCT, through 21st, 1700, will see USKA's "Helvetia-22" contest in progress. Non-Swiss entries will work as many of the 22 Swiss cantons as possible, c.w. or 'phone, the usual six-digit serial will be exchanged. Watch for HB1 portables in rare cantons.

South America — The ham bug has dug its way emphatically into Easter Island. From CE3AG (CEØAA): "Jorge Bertain, CE3DG . . . will install station CEØAC for Dr. Darlo Verdugo, who will remain on the island for a year. This 40-watt station, with S-76 receiver, will preferably be used on 'phone on approximately 14,100 kc. Another station will also be installed by CE3DG on Easter Island for the Chilean Air Force. It will be a BC-610 mainly used for meteorological reports and its operators will also work on amateur bands as CEØAD, on c.w. and 'phone. During the 12 or 16 days that CE3DG will be on the island he will [sign] CEØAA. . . . All QSLs for CEØ stations must be sent to the QSL Bureau of the Radio Club of Chile, Box 761, Santiago." . . . . Upon awarding W6AM Radio Club of Argentina's CAA, CCC and TPA certificates, RCA contest manager LU9AD wrote: "By now you have practically all the certificates this club can offer, so permit me to forward my sincere congratulations for such an outstanding achievement." . . . . Ex-HC2OT hit the air temporarily as OA4DX . . . . Ultra-active CX6AD, on the air since October, 1947, employs a 76-6L6-807 line-up at 60 watts input, a 5-tube superhet and a half-wave Hertz antenna. Aurelio claims DXCC, WBE, WAS and WACE sheepskins and is deservedly admired for a fast 100 per cent QSL policy . . . . VP3VN remains active on 20 c.w. with a 40-watt 6L6-807 transmitter and an HQ-120X . . . . HK1TH, who works with PAA, has an agile 150-watter on 14-Mc. c.w.; he receives with a BC-224 . . . . Announcement of the RCV (Venezuela) Interamerica Contest, a 'phone affair, unfortunately arrived too late for inclusion in February *QST*. W1AW did its best to pass the word along before the contest dates of Feb. 19th-21st. If you missed W1AW's information, this item at least will tip you off as to what was cooking . . . . YV5AK's work allows him to get in some extensive traveling up this way. Manuel still finds opportunity to catch some of the rare ones on returns home to Caracas.

Hereabouts — From Canal Zone SCM KZ5NM: German expedition ship *Xarifa*, a 320-ton, 3-masted schooner of 143-foot length, stopped at Cristobal in December en route the Galapagos. Dr. Hans Hass, well known European scientist, leads a group of experts engaged in underwater research consisting of diving and photography. Mrs. Hass, the only woman aboard, is an active working member of the expedition, doing underwater work along with the others. Including crew, *Xarifa* carries twenty-two. Ship's doctor Heino Sommer operates the ship radio as DI9AA on amateur bands. Through arrangements made by TI2TG, Dr. Sommer has been authorized to operate ashore at Cocos Island under the call TI9AA. He will use his own receiver, and transmitting equipment loaned him by Canal Zone hams, gear consisting of a portable power plant, Elmac transmitter and miscellaneous accessories. DI9AA's (and probably TI9AA's) principal operating frequencies are 14,010, 14,050, 14,150 and 14,200 kc., the latter two on 'phone. *Xarifa* will return to the Canal Zone on her voyage back to Germany . . . . . WØIUB finds that KG4AN is about to head for Stevensville, Tex., after 2½ years of Guantanamo Bay operation and some 10,000 QSOs . . . . . VP5RU is n.g., VP5AD advises W2NZE

(Continued on page 122)

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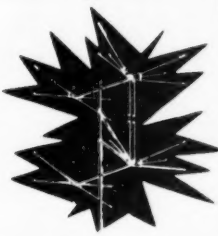

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The Philco Television Booster Model TB-3 is a high quality, push-pull, wide-band radio-frequency amplifier designed to amplify r-f signals in the television bands. This unit employs two 6J6 tubes as r-f amplifiers, uses a selenium rectifier in a self contained power supply. Channels 2 through 13.

Talk about tuners!

THE STANDARD CASCADE TUNER TOPS 'EM ALL!

$14.95 *ea.*
$14.25 *ea. in lots of 3*

BRAND NEW! GUARANTEED!

The No. 1 Tuner in the trade. Lafayette is out front with this red-hot **STANDARD COIL CASCADE TUNER** deal. Lafayette made a buy—we paid cash—and you get the saving! Regular dealer price $24.50. Servicemen, now is the time to stock up and save! *Size: 4¾" x 3¼" x 6¼" supplied with 6J6 and 6BQ7. Stock No. TL-11. Shpg. wt. 4 lbs.*

HORIZONTAL BAR GENERATOR

Provides Horizontal Lines On Any T.V. Set— Quick— Accurate Alignment

Generates a series of equally spaced horizontal lines to indicate picture linearity. Simplifies precise setting of yoke. Makes possible accurate positioning of focus coil or magnet. Quick adjustment of vertical linearity, height and centering. No bulky, expensive equipment needed. Plugs onto picture tube. Completely self-contained.

TS-129.....NET 1.91

Top Quality CRYSTAL MIKE

$5.75

- —52 db output level
- Range 30 - 10,000 cps
- 10 ft. cable and connector
- Handle and interlocking base

A really fine microphone by a manufacturer known the world over. Use for amateur broadcasting, public address and home recording. Can be used with floor stand. Shpg. wt. 2½ lbs.

PA-21.....5.75

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Hearing Aid

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our price **$14.95**

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Stock No.	Mil	Each	Lots of 10 Each
RE-12	65 MA	.57	.55
RE-14	75 MA	.67	.64
RE-10	100 MA	.80	.75
RE-15	150 MA	.92	.85
RE-16	200 MA	1.19	1.08
RE-11	250 MA	1.29	1.19
RE-17	300 MA	1.39	1.29
RE-18	350 MA	1.57	1.50
RE-13	400 MA	1.75	1.68
RE-19	450 MA	1.77	1.70

Most popular sizes for radio and TV. Famous brand. All fresh, new stock. Input voltage 130 volts. You can't go wrong at these prices.

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Low Frequency — FT-241A for SSB, Lattice Filter etc., .093" Pins, .486" SPC, marked in Channel Nos. 0 to 79, 5th Harmonic and 270 to 389, 72nd Harmonic. Listed below by Fundamental Frequencies, fractions omitted.

49¢ each—10 for $4.00 — 99¢ each—10 for $8.00

370	393	414	436	498	520	400 459
372	394	415	437	501	522	440 461
374	395	416	438	502	523	441 462
375	396	418	481	503	525	442 463
376	397	419	483	504	526	444 464
377	398	420	484	505	527	445 465
379	401	422	485	506	529	446 466
380	402	423	486	507	530	447 468
381	403	424	487	508	531	448 469
383	404	425	488	509	533	450 470
384	405	426	490	511	534	451 472
385	406	427	491	512	536	452 473
386	407	429	492	513	537	453 474
387	408	430	493	514	538	454 475
388	409	431	494	515		455 476
390	411	433	495	516		456 477
391	412	434	496	518		457 479
392	413	435	497	519		458 480

99¢ each—10 for only $8.00

CR-1A
SCR 522-1/4 Pin, 1/2" SP

5910	7350	2030	2220	2390	3120 3520
6370	7380	2045	2258	2415	3150 3550
6450	7390	2052	2260	2435	3155 3570
6470	7480	2065	2280	2442	3202 3580
6497	7580	2082	2282	2532	3215 3945
6522	7810	2105	2290	2545	3232 3955
6547	7930	2125	2300	2557	3237 3970
6610		2131	2305	2660	3250 3995
		2145	2320	2940	3322
		2155	2360	3035	3510

FT-171B — BC-610
Banana Plugs, 1/4" SPC

Special — 200 KC or 500 KC in FT241A Holder — only $1.79 each

add 20¢ postage for every 10 crystals (or less)

FT-243 — .093" Pin Dia. — .486" Pin SPC for Ham and General Use

49¢ each—10 for $4.00

4035	5437	5950	6800	7610	7900	
4080	5485	5973	6806	7625	7906	
4165	5580	6240	6825	7640	7925	
4190	5660	6250	6850	7641	7940	
4280	5675	6273	6875	7650	7950	
4300	5700	6275	6900	7673	7973	
4330	5706	6300	6925	7675	7975	
4397	5725	6325	6950	7700	8206	
4490	5740	6350	6975	7706	8225	
4495	5750	6373	7450	7720	8250	
4535	5773	6375	7473	7725	8273	
4735	5780	6400	7475	7740	8275	
4840	5806	6406	7500	7750	8300	
4930	5840	6425	7506	7773	8325	
4950	5852	6673	7525	7775	8630	
4980	5873	6675	7540	7800	8683	
5030	5875	6700	7550	7825	8690	
5205	5880	6706	7573	7840		
5300	5906	6725	7575	7850		
5335	5925	6750	7600	7873		
5379	5940	6775	7606	7875		

99¢ each—10 for $8.00

1015	3840	6473	7100	8025	8475	
1110	3885	6475	7125	8050	8500	
1915	3940	6500	7140	8073	8525	
1930	3955	6505	7150	8075	8550	
1940	3990	6550	7175	8100	8575	
1950	6000	6573	7200	8125	8600	
2065	6025	6575	7250	8140	8625	
2125	6050	6600	7300	8150	8650	
2557	6075	6606	7306	8173	8700	
2940	6100	6625	7325	8175	8733	
3500	6125	6640	7340	8200		
3640	6140	6650	7350	8340		
3650	6150	7000	7375	8350		
3720	6175	7025	7400	8380		
3735	6200	7050	7425	8490		
3760	6410	7073	7450	8425		
3800	6450	7075	8000	8450		

BC-746 TUNING UNITS

Foundation coils and condenser for 80 meter VFO or exciter — Less xtals.— **98¢**

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Applications should contain details of past experience. Write to

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STROMBERG-CARLSON CO.
Rochester 3, New York

. . . . . When not QRL adding to his impressive QRP DX list, W2QHB accumulates YL QSLs. Howy recently applied for YLRL's YLCC-200 endorsement . . . . . Among No. Calif. DX Club personnel there are W6s AM BAX DZZ MEK MVQ MX PB TI TT VE and WB with over 200 countries confirmed apiece. W6s OMC RBQ and ZCY teeter on the brink with 199 each. Nine 'phone and 53 free-style DXCCs are held by NCDXC members . . . . . With the Bahamas gang, VP7NM has a 140-watt VFO-807-05 rig, BC-348 receiver and folded dipole. "C.N." is WBE, WAS, BERTA and DXCC. Don of VP7NS does well with an 813 final at 150 watts, a BC-348 and a folded dipole . . . . . OX3UD makes out okay on 20 c.w. with a 3-tube receiver and 40 watts input . . . . . A 12-watt c.o.p.a. transmitter and simple Windom skywire cause plenty of excitement whenever VP1AA puts British Honduras on 14-Mc. c.w. . . . . Running 350 watts on several bands, YS1O is a good bet for Salvador QSLs. BERTA, DXCC, WAA, WACE,

OQ5NK of Leopoldville works many W/VE 'phones as well as his own share of rare DX.

WACO, WBE and RCC diplomas are to be found on Oscar's walls . . . . . G2RO, as VP2GRO, told W1ZDP that all "RO" Caribbean QSLs will be mailed from England this month . . . . . Ex-K7TF-W7RT ('28-'34) just got back on the air in E. Liverpool, Ohio, as W8RZ. Mac operated K7TF from Craig, Alaska, in 1928 and 1929. . . . . W9UTZ, operator at KF3AB as shown in photographs last month, in a recent narrow escape from the Grim Reaper suffered an attack of appendicitis while on duty on Fletcher's Ice Island. Larry had to be rescued for air transport to Thule base (see Jan. 25th issue of *Life*) for surgery. Terrible weather conditions were surmounted barely in time to save his life . . . . . Ron Coakley, ZL2RC, and Mrs. Coakley are spending six months in the States on the return leg of a world tour. Ron has met hams all over the country and he asks us to express here his appreciation for wonderful U.S.A. hospitality. In early April he expects to pass through Texas and Arizona en route Los Angeles. Visits are scheduled with W6VAD, W6ZOX and others contacted from "down under" by ZL2RC. A stop at W6AL, Lodi, will conclude his stay. The Coakleys will sail from San Francisco on the *Oronsay*, June 11th, for Auckland via Honolulu and Samoa . . . . . The idea for Jeeves' cartoon predicament this month was donated by W1UNG. Randy ordinarily is a very kind-hearted fellow.

Answer to QUIST QUIZ on page 106

B sent "E", "T" and "I", at widely-spaced intervals. **A** called the E an E, but **B** said it was a high-speed T. **A** called the T a T, but **B** said it was a very slow E. **A** called the I an I, but **B** said it was high-speed TT. Since the transmissions were made at widely-spaced intervals and no speed had been established by previous code, **B** had a sure-thing bet.

NEWARK's Special Selections

Each component is a VALUE in quality and price

Bargain Clearance of Standard Brand Oil-Filled Capacitors

Special Bargain Offering. High Quality Standard Brand Capacitors, made by nationally known manufacturers. All oil-filled, rectangular cased. Voltages shown are Working Volts DC. With porcelain standoff insulators, screw terminals, with solder lugs, nuts and washers. Less brackets. Limited Quantities.

A100. 2 Mfd. 600 V. 2⅞x1¾x1". Shpg. wt., 10 oz. **NET, 10 For 3.00. EACH** **39c**

A101. 14 Mfd, 600 V. 4¾x3¾x1¾". Shpg. wt., 2 lbs. **NET** **4.95**

A102. 4 Mfd. 1000 V. 3⅞x3¾x1¼". Shpg. wt., 1¼ lbs. **NET** **1.50**

A103. 1 Mfd, 1500 V. 3¾x1¾x1". Shpg. wt., 12 oz. **NET** **1.25**

A104. 2 Mfd. 1500 V. 3⅝x2½x1¼". Shpg. wt., 1 lb. **NET** **1.50**

A105. 2 Mfd. 2000 V 3-15/16x3¾x1¼". Shpg. wt., 1½ lbs. **NET** **1.75**

A106. 12 Mfd. 2500 V. 6½x4⅛x3⅞". Shpg. wt., 7 lbs. **NET** **8.95**

A107. 0.5 Mfd. 3000 V. 4⅞x2½x1¼". Shpg. wt., 1 lb. **NET** **1.25**

A108. 1 Mfd, 3000 V. 3⅞x3¾x1¾". Shpg. wt., 2 lbs. **NET** **3.50**

A109. 2 Mfd. 3000 V. 4⅛x3¼x3¼". Shpg. wt., 3¼ lbs. **NET** **5.50**

A110. 6 Mfd. 3000 V. 7½x4⅛x3⅞". Shpg. wt., 8 lbs. **NET** **8.95**

A111. 2 Mfd, 4000 V. 6x4⅛x3⅞". Shpg. wt., 6½ lbs. **NET** **6.95**

A112. 1 Mfd, 6000 V. 7½x4⅛x4¾". Shpg. wt., 9 lbs. **NET** **8.95**

A113. 1 Mfd. 7500 V. 7x8x4". Shpg. wt., 19 lbs. **NET** **12.95**

A114. Dual 0.1 Mfd at 10,000 Volts. 7x8x4". Shpg. wt., 18 lbs. **NET** **10.95**

A115. Dual 0.25 Mfd at 10,000 Volts. 6x8x4". Shpg. wt., 14 lbs. **NET** **12.95**

A116. G.E. Type 14F357 Pyranol-filled Transmitting Capacitor. 5.25 Mfd at 5000 Volts DC Working. 13x13½x4½". Shpg. wt., 55 lbs. Limited Quantities. **NET** **24.50**

Bargains in Round Can Capacitors. Standard Brands, made by nationally known manufacturers. All oil-filled. Less mounting brackets. With porcelain insulators, screw terminals. Voltages shown are Working Voltages DC. Quantities Limited.

A117. 1 Mfd, 1000 V. 3⅛" long x 2" diam. Shpg. wt., 10 oz. **NET. 10 For 6.50. EACH** **78c**

A118. 2 Mfd, 1000 V. 4⅛" long x 2" diam. Shpg. wt., 1 lb. **NET** **1.29**

Local Customers. Come in and browse around our tremendous stocks of Bargain Components, Ham, PA and service items galore! Huge quantities of Bathtub and Motor Starting Capacitors, but not sufficient quantities of single items to warrant listing here. **Mail Order Customers.** Write your requirements.

SELECTED VALUES IN QUALITY COMPONENTS

A500. Low Loss Steatite Socket. For 829B/-3E29 or 832 tube. Center has large cooling hole. Less shield base. Mfd. by Johnson. 2" mtg. ctrs. Shpg. wt., ½ lb. **NET EACH** **49c**
10 For **4.00**

A501. Brush BA-116 Mike. At lowest price ever! While quantities last. Rugged microphone, ideal for tape recording, PA or Amateur use. Resp., 50 to 6,000 cycles. Output level, —53 db. High impedance. ⅝"-27 thread. Brown finish. Shipping weight 1½ lbs. **NET** **5.95**

A502. Filter Reactor. 5.3 Henry, .06 Ampere DC, Resistance 475 ohms, 2400 volt test. Size: 2-3/16x1⅞x1¾". Porcelain standoff insulators. Four 8-32 mtg. screws on 1-1/16x1-5/16" mtg. centers. Shpg. wt., 2 lbs. **NET** **29c**

A503. G.E. Filter Choke. Open type. 2¼ Henry, 200 ohms DC resistance. 9" wire leads. 3⅛" mtg. ctrs. Shipping weight 2 lbs. **NET** **1.19**

A504. 63 Mmf Variable. Ideal for VFO. High Quality capacitor designed for use in the famous BC-375. 2500 volt flashover. Micrometer adjustment. Shpg. wt., 2 lbs. **NET** **1.10**

SAVE ON GENERAL ELECTRIC RHEOSTATS

G.E. Quality Rheostats in 25 and 50 watt sizes. Carbon brush contacts. Vitreous enameled windings on porcelain cores. Shafts extend 7/16" from ⅜" bushing. Require 1¾" space back of panel. With knobs and hex nuts. **25 watt:** 1½" diameter. Shpg. wt., 8 oz.

50 watt: 2¼" diameter. Shpg. wt., 10 oz.

A506. 10 ohm, 25 watt.
A507. 15 ohm, 25 watt. **NET EACH**
A508. 50 ohm, 25 watt. **98c**
A509. 125 ohm, 25 watt.
A510. 250 ohm, 25 watt.

A511. 4 ohm, 50 watt.
A512. 6 ohm, 50 watt. **NET EACH**
A513. 80 ohm, 50 watt. **1.47**
A514. 125 ohm, 50 watt.
A515. 225 ohm, 50 watt.
A516. 300 ohm, 50 watt.

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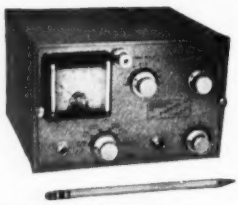

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10, 11, 15, 20, 40, 80 METERS

BABCOCK
MOBILE D-X MITTER

*C*an be tuned up to switch between 2 of the 6 bands with 2 crystals in each band — then one of the 4 frequencies and the proper antenna may be selected by the 4-position switch with no further tuning required.

- No plug-in coils
- The 4 xtals fit inside transmitter
- 8" wide x 5" high x 7" deep
- Tubes: 6AQ5 osc-doub-quad, 6146 final amp. **12AU7** speech ampl., 2 — 6AQ5 mods, Class AB
- Input to final amp. when using Babcock PS **4A** power supply: 45 watts
- Complete metering, including RF output watts

PRICE $99.50 NET including tubes and connecting plugs, less crystals.

Write for Details

S 4A 6 • DC • Dual vibrator supply with vibrators, tubes and connecting plugs $67.50
PS 1B 115VAC • Power supply for home station, with tubes $44.95
LS 1 • 2 band antenna tuning unit $15.00

C & G RADIO SUPPLY CO.

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PORTABLE LIGHT PLANTS PUSH BUTTON START

AC Plant 600-700 Watts — 115 v. 60 cyc. Powered by a rugged 2 hp. easy starting Briggs gas engine. No wiring necessary, just plug in and operate. Plenty of current for receivers, transmitters, antenna motors, emergency lights, etc. which require up to 700 Watts. Ideal for radio amateurs, Civil Defense, trailers, and camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries.

(Item 24) Item 24. Wt. 75 lbs. Be prepared if war or storms knock out power lines **$143.50**

700-800 Watt Plant (Item 44) same as above but with larger engine & greater capacity **$169.95**

1000-1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine — 50% greater output **$199.50**

We make all sizes up to 25,000 Watts. Write for information.
Send 10¢ for big 1954 Catalog Free with order.
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INSTRUCTOGRAPH COMPANY

4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS

World Above 50 Mc.

(Continued from page 57)

were kept whenever possible during December, for a total of 74 different test periods. These were at 0645 and 0655, and 2135 and 2145, 5 minutes each. The reason for the two checks close together, morning and evening, is to permit observations of the direct path, a heading of 60 degrees at W4HHK, and a second check with a heading 15 degrees north of this.

Of the 74 tests, 14 were made during a period when the antenna system at W4HHK was not in perfect working order, but even so, signals of a sort were heard on a high percentage of the tries. Using their modified R scale (R1 for very short bursts, no intelligibility; R2, letters or groups, with some information; R3, bursts of 15 seconds to 2 minutes) the December tabulation breaks down as follows: 17 tests over the direct path rated R2 or better, with 11 of similar rating on the indirect path. Two test periods were given R1 to 2, and 30 were called R1.

The longest period of continuous signal on the direct path was 11 seconds duration, while the indirect path netted one of 18 seconds. The greatest number of bursts counted during a 5-minute test period on the direct route was 27; on the indirect path 33. The counts are taken first by monitoring W2UK's signal, and then by playing back a tape recording made during the period, for a recheck. Results of tests on a path 10 degrees off the direct route, conducted during January, will be reported next month.

W4HHK has lined up another DX schedule, this one with W9WOK, Bensenville, Ill., a distance of close to 500 miles. Inaugurated on January 8th, it has been producing results regularly. W9WOK runs 750 watts and uses a 24-element array. Skeds are kept at 1945 each Tuesday and Thursday.

Results over the 450-mile path between W8BFQ, West Richfield, Ohio, and W1HDQ indicate that a signal can be heard over this 450-mile path just about any night. Signals are seldom solid enough for much communication, even on c.w., but W8BFQ is heard by your conductor regularly, regardless of conditions. Margaret's very large array (32 elements with ⅝-wavelength spacing) high power and excellent location help to make this possible with only a 16-element array at the eastern end.

W2UTH, Rochester, N. Y., has completed his TV camera and is now working on associated equipment. Hank reports a slump in activity on 144 Mc. around Rochester as the result of the appearance of a local TV station on Ch. 10. Much of the trouble has been traced to the receivers, and it is hoped that when the station goes on high power the trouble will be taken care of in a high percentage of cases.

W3UQJ, York, Pa., now has about 5 watts output, crystal controlled, on 435.5 Mc. He would like schedules with the Philadelphia area for tests on that band.

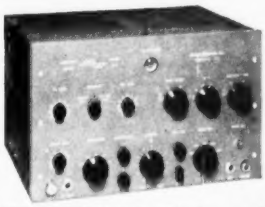
Two 2-meter nets are reported by OES appointees in Ohio. W8DPW says that the Dayton area is using 146.52 Mc. each Wednesday at 2100. At the year's end the membership was 32, with more expected, and the gang turned out in force for the V.H.F. Sweepstakes in behalf of the Dayton Amateur Radio Association. Stations in Cincinnati and other cities within range are invited to join in net sessions. Two of the gang are on 435 Mc. and 6 on 220 Mc. Fixed-frequency operation on these bands will be started if there is sufficient interest.

A 2-meter f.m. net is flourishing in the Columbus area, according to W8LVF. This net got its start last spring when several commercial installations were purchased with c.d. funds and installed in various public buildings and zone stations. When the Columbus gang started looking into the possibility of converting taxicab and other mobile gear for ham use, and it was found that, with a little ingenuity and a few parts from the junk box, much of this sort of gear could be made to serve amateur needs very nicely.

Operation is on 145.26 Mc., with most of the equipment fixed on this channel. Receivers equipped with squelch are left running continuously, so that it is nearly always possible to get a contact. The Franklin County Civil Defense Net holds a weekly practice drill at 1930 each Tuesday. All stations, both fixed and mobile, participate.

Another f.m. net, this one on 145.5 Mc., is reported by W4HHK. Using converted commercial gear, the net covers the Memphis area, and it has already been called into

(Continued on page 180)



CENTRAL ELECTRONICS Announces A *NEW* BAND-SWITCHING MULTIPHASE EXCITER

MODEL 20A

★ 20 Peak Watts Output — SSB, AM, PM, and CW.

★ Bandswitched — 160 thru 10 meters.

★ Magic Eye carrier Null and Modulation Peak Indicator.

MULTIPHASE MODEL 10A→

MULTI-BAND OPERATION. Approx. 10 watts peak output 160 thru 20 meters. Reduced output on 15-10 meters. SWITCHABLE SSB, with or without carrier, double sideband AM, PM, break-in CW, VOICE OPERATED BREAK-IN and receiver disabling. Built-in power supply also furnishes voltage for optional VFO and blocking bias for linear amplifier. With master xtal and coils for one band. Wired and tested $159.50. Complete kit $112.50. Extra coil sets $3.95 per band.

SIDEBAND SLICER MODEL A

Improves ANY receiver. Upper or Lower sideband reception of SSB, AM, PM, and CW at the flip of a switch. Cuts QRM in half. Eliminates distortion caused by selective fading. Built-in power supply. Substitutes for diode detector in any receiver having 450-500 K. IF. Wired and tested $74.50. Complete kit $49.50.

AP-1. Plug-in IF stage—used with Slicer, allows receiver to be switched back to normal. Wired and tested, with tube $8.50.

PS-1. Plug-in prealigned 90° phase shift network and socket available separately for use with CE Signal Slicer and SSB Jr. $7.95 postpaid.

Check These Additional Features

- *NEW* CARRIER LEVEL CONTROL—separate knob inserts any amount of carrier without disturbing carrier suppression adjustments.
- *NEW* CALIBRATE CIRCUIT—simply talk yourself exactly on frequency as you set your VFO.
- *NEW* CALIBRATE LEVEL CONTROL—adjusts signal strength to suit band conditions.
- *NEW* FONE PATCH INPUT JACK.
- *PLUS* All the time-proven features of the popular Model 10A.

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested. $249.50

QT-1 ANTI-TRIP UNIT

Perfected Voice Operated Break-in with Loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic—no relays. Plugs into socket inside 20A or 10A Exciter.

Wired and tested, with tube $12.50

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Virtually Eliminates Harmonic TVI
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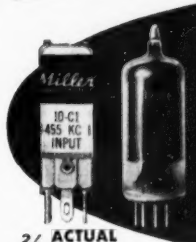

2/3 ACTUAL SIZE

The FAMOUS
SUB-MINIATURE
K-TRAN*
I.F. TRANSFORMER
ONLY ½" SQUARE BY 1½" HIGH
Over-all, Inc. Terminals, 1-15/16"

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THE FAMOUS "K-TRAN" I.F. TRANSFORMER HAS NOW BEEN MINIATURIZED. For the first time we are now able to supply a 455 KC intermediate frequency transformer which has all the desirable features of the conventional size I.F. and smaller than a miniature tube.

Through the use of a Ferrite shell core material these Sub-Miniature I.F. Transformers offer the gain and bandwidth characteristics previously obtained only in larger I.F. assemblies.

It is now possible to construct personalized receivers smaller than ever before. These transformers may be used with sub-miniature tubes where sockets are not required.

Catalog No.			Net Price
10 – C1	455 KC	Input Transformer	$1.50
10 – C2	455 KC	Output Transformer	$1.50

(Available through your local distributor)

* Manufactured under "K-TRAN" patents of Automatic Mfg. Co.

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GROUND PLANE ANTENNAS

For Your RACES Jobs

A fully adjustable type with secure-locking elements which may be set for 20 to 10 meter operation or for 40-60 meters. All-aluminum construction, waterproof cable housing, standard ½-in. threaded sleeve for mounting. Ask your jobber or write for special Bulletin.

PREMAX PRODUCTS
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"YOUR FRIENDLY SUPPLIER"

HEADQUARTERS FOR TRIAD ELECTRONIC TRANSFORMERS

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CONCORD, N. H.

Holds the Screw!
Drives it too!

Unconditionally Guaranteed

Quick-Wedge
SCREW-HOLDING
SCREWDRIVER

Ask for it at your Dealer

Kedman Co., 233 S. 5 W., Salt Lake City, Utah

service for local emergencies. One such recently was the alerting of a Memphis hospital for an emergency operation, during a snowstorm that had interrupted outlying telephone service.

W9LEE, Westboro, Wis., reports completion of a new r.f. section, with all exciter stages and 4-125A p.p. final on one chassis. It is being operated at 250 watts at present, pending completion of a high-voltage supply for full power. Rolland says that there is discussion of the formation of a v.h.f. club in Eau Claire, for the benefit of the gang in western Wisconsin.

Tried Your TV Antenna?

This is no new idea, but we'll wager that a lot of would-be v.h.f. enthusiasts haven't thought of trying it. W9ZJA, Green Bay, Wis., found the winter weather none too enticing for working on his 16-element array for 144 Mc., so he decided to try his two-bay conical TV antenna as a temporary expedient. Being a broadband device, the conical does quite well on both 2 and 6, as W1KCS, Providence, R. I., will bear witness. W9ZJA has heard stations up to 200 miles away on 144 Mc., and though he runs only 11 watts input his signal has been reported as far south as Milwaukee, a distance of about 100 miles.

W1KCS lives in a city location where there is no room for several beams, but that hasn't kept him from working some good stuff on both 50 and 144 Mc. with his stacked conical. A look at the Rhode Island Section tabulation in almost any v.h.f. contest in recent years will show what Al has been able to do with no ham antennas at all.

W1VLH and his father were TV DX enthusiasts before they got hot on 144 Mc., so there is a 16-element collinear TV array 100 feet in the air above their West Hartford home. It doesn't begin to compare with the 32-element array pictured in December *QST* that now serves on 144 Mc., but before the big 2-meter job was built the TV array made it possible for W1VLH to knock off some very nice stuff on 144 Mc. It also gives a good account of itself on 220 Mc.

Before you conclude that you can't do much on 50 Mc., or higher bands until you put up some kind of high-gain beam, don't overlook the possibility of using the family TV bird roost, especially if it's of the conical or collinear variety. It will probably have it all over a folded dipole or ground plane in the attic. This is an especially good trick for 2-meter hams in vertical polarization areas who want to have a go at horizontal.

2-Meter Standings

A glance at our 2-meter standings box this month will show that quite a few calls have been deleted. Some of these were dropped for known lack of activity; others because their totals do not represent outstanding accomplishment in their particular areas. To be most significant, these listings should be complete *and* up to date. If you have a record on 144 Mc. that is equal to or better than any of those listed, please drop us a line with the complete details. Facts required: states worked (VE and XE do *not* count), call areas worked (again, only W call areas), and best DX worked (this can include any country) in miles. QSLs or other confirmation not needed; we'll ask for cards only if you claim WAS!

FEED-BACK

In the circuit of the modulator unit for the beginner's 220-Mc. station, Fig. 5, December *QST*, the value of C_1, C_6 and C_9 should be 25 μf.

HAMFEST CALENDAR

OHIO — Saturday, April 3rd, at the Dayton Biltmore, Dayton — the Dayton Amateur Radio Association will hold its annual Hamvention. Hamvention is the best treat in ham radio — ask anyone who has attended. The day-long program will feature outstanding speakers on all phases of amateur radio and a special program has been prepared for the ladies. The affair will wind up with a banquet at 7 P.M. in the hotel ballroom. Tickets are $5.00 in advance or $5.50 at the door. Reservations, more information and an attractive brochure may be obtained from D.A.R.A., P. O. Box 44, Dayton 1, Ohio.

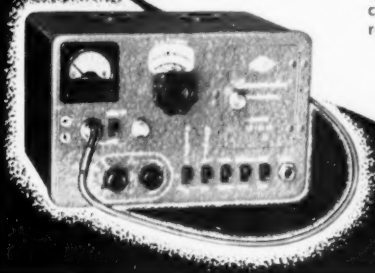
"COMMANDER" TRANSMITTER

NOW . . . permits power inputs up to 50 watts AM.

COMMANDER

. . . . . an extremely compact and versatile transmitter, advanced in design, modern in circuitry. It covers a continuous frequency range from 1.7 to 54 mcs and may be operated xtal control as-is or with the Gonset VFO. A 6146 output tube and two 7C5's as modulators permit plate voltages of 400 to 500 volts—inputs, (modulated) to 50 watts. Two high Q coils provide coverage of 75-40-20-15-11 and 10 meter amateur bands and are readily changed from front of housing. The output circuit eliminates loading problems frequently present with pi networks where the load is a short, loaded mobile antenna. Circuit also couples into balanced or unbalanced lines, can be quickly converted to "Pi" or "L" networks by simple wiring change. Driver is bandswitched. The Commander uses any standard carbon or PA-type dynamic or crystal microphone. No preamp required.

SIZE: 5⅜" high, 8½" wide, 7⅛" deep.



An excellent VFO is available as a companion unit for the Commander. This is an extremely stable, low drift unit and uses no tubes—requires no operating voltage—coax cable, (furnished) plugs into fitting on Commander panel. Unit covers 75-40-20-15-11-10 meter amateur bands. Very rugged and compact—can mount next to transmitter or on steering column.

COMMANDER (with tubes) . . . Net 124.50

VFO . . . . Net 29.95

FIRST WITH THE FINEST!!

GONSET

801 SOUTH MAIN ST. BURBANK, CALIF.

W7NLM

GOLD PLATED SILHOUETTE CALL LETTER PINS

Silhouetted on an enameled black bar, with safety catch pin. Price includes 5 letters only. Additional letters 20¢ each. Postpaid each $2.50.

GLENN H. WALKER

P. O. Box 1082 Cincinnati 1, Ohio

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A Service of Radio Corporation of America

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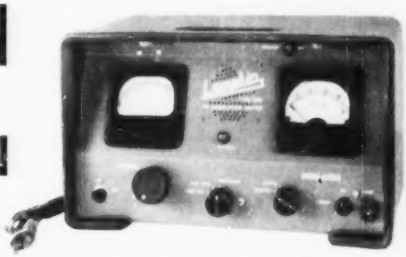
Approved for Veterans

Write Dept. ST-54 for Catalog

THERE'S MONEY IN

Commercial Mobile-Radio Maintenance

with 2nd class ticket and LAMPKIN METERS



CHECK FREQUENCY AND FM SWING TO FCC SPECIFICATIONS

LAMPKIN 205 FM MODULATION METER. Direct indication of peak voice deviation, 0–25 kc, positive or negative. Tunable 25–200 mc in one band. Relative field strength meter. Built-in speaker. Weighs 14 lbs. Width 12¼".

LAMPKIN 105-B MICROMETER FREQUENCY METER. Uses one crystal to measure all transmitters from 0.1 to 175 mc. Gives readings of percent error from assigned frequencies. Precision CW signal generator for receiver final alignment. Weight 12½ lbs. Width 13".

MAIL COUPON TODAY!

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Please rush more dope on the 105-B and 205.

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MAKE YOUR SIGNAL OUTSTANDING WITH A LOW LOSS FOLDED DIPOLE ANTENNA KIT

FEATURING OPEN WIRE COPPERWELD CONSTRUCTION

450 ohm open wire flat top gives true folded dipole performance, minimum loss. "LL300" ohm open wire transmission line gives perfect impedance match — low loss. Clear plastic center connector block with sleeve connectors — no soldering necessary. Low loss polystyrene spacers on both flat top and transmission line. Low wind resistance — copperweld construction guarantees long life. 6 models — 50′ to 250′ transmission line lengths.

YOU GET ALL THIS

Roll of 300 and 450 ohm open wire transmission line . . . 1 thermoplastic center connector block . . . 2 — 4″ porcelain end insulators . . . complete instructions.

Write Today . . . or send QSL card, attention W4TJF, for FREE folder — specifications and prices.

MANUFACTURED AND SOLD BY:

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CANADIANS! We have large stocks of nationally advertised Ham parts. *Write for Free catalog.*

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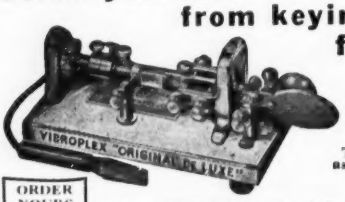
VE3YR "Geo" 119-121 JOHN ST., N. HAMILTON, ONT. VE3JU "Bill"

FREE yourself from keying fatigue



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Easy does it . . . free your nerves from tension . . . your arm from ache and strain. An easy working Vibroplex does all the arm-tiring work for you. A finger-touch on vibrator button gives you clean, uniform signals at any desired speed. No arm tiring effort, no matter what the operating conditions. Easy to learn. Even beginners use it in a matter of minutes. Here's keying at its easiest and best. So many advantages are yours with an easy working Vibroplex key. You'll certainly want one without delay. Five models, $12.95 to $29.95. Left hand models, one dollar more. At dealers or direct. FREE descriptive folder.

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M. A. R. S.

"Youth Wants to Know" About MARS Activities

"Youth Wants to Know" is the name of a successful commercial television show. The term also is appropriate in describing the response of younger amateurs to lowering of the age requirement for MARS membership from 21 to 16 years. The change became effective on November 26th, 1953, the fifth anniversary of the MARS program.

Leading the contingent of young amateurs who have joined MARS was Charles B. Weaver, jr., 17, A3VAR, of Chevy Chase, Maryland. Charles is a senior in high school, and holds a General Class license.

Charles B. Weaver, jr., 17 (A3VAR) of Chevy Chase, Maryland, is the first civilian member of the Military Affiliate Radio System under the new minimum age requirement.

More than 100 other young amateurs from all over the United States have either been accepted or have indicated a desire to join and have been furnished information about MARS.

MARS, although it does not affect the draft status of any individual, does offer an opportunity for young men and women to learn more about military radio communications. Through MARS they are permitted to obtain first-hand knowledge of military methods and procedures. They operate in military nets for on-the-air training. Instruction is given in message center procedure and message handling.

Amateurs interested in MARS may request information about the Army and Air Force programs by writing to:

Chief, MARS (Army), Room BE-1000, The Pentagon, Washington 25, D. C., or MARS Command Director, Continental Air Command, Mitchell Air Force Base, New York.

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Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

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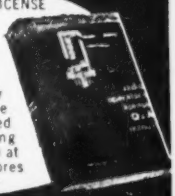

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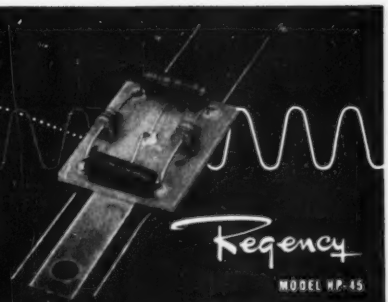
The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line.
Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db. or more.
Signals above 55mc. are passed through the filter without loss.
Simple to install--full instructions included with each unit.



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MODEL HP-45

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AMATEUR NET ONLY 99c

What makes cancer MAN'S CRUELEST ENEMY?

SOME diseases kill us mercifully.

NOT CANCER. Yet, if nothing is done, 23 million living Americans are destined to die of cancer . . . 230,000 of them *this year*.

SOME diseases reveal their beginnings by pain or fever or shock. Not cancer. It starts silently, secretly, and too often spreads rapidly.

AND SOME diseases spare us our young people. Not cancer! It strikes men and women and children, the old and the young. If nothing is done, one American in five will be stricken with cancer.

SOMETHING CAN BE DONE. You can strike back at this cruel killer with a really generous gift to the American Cancer Society. Your money is *urgently* needed—for research, for education, for clinics and facilities. Please make it a really BIG gift!

Cancer
MAN'S CRUELEST ENEMY
Strike back—Give
AMERICAN CANCER SOCIETY

NOW IN STOCK

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. . . the new Johnson Viking II Transmitter kit, all parts furnished, including: tubes, cabinet, punched chassis, wiring harness, wire, solder, terminals, grommets and all other hardware. 115V 50/60 cycle operation only. For further information, and purchases, write to:

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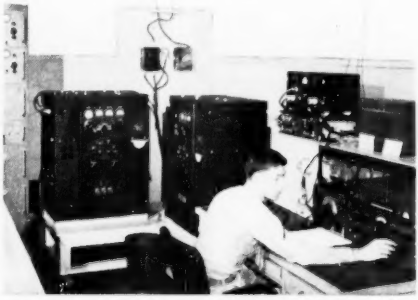
U. S. N. R.

Vicksburg Tornado

During the month of December, 1953, a tornado struck the city of Vicksburg, Mississippi. The Naval Reserve Training Center at Vicksburg furnished emergency communications to the stricken community. The Naval Reserve Training Centers at Natchez, Miss., K5NRW; Greenwood, Miss.; Greenville, Miss., K5NBU; and Memphis, Tenn., K4NRV; assisted in the operation as part of the Naval Reserve Emergency Communication Network of the Sixth Naval District.

Here and There

Naval Reserve radio station N1RRA, Naval and Marine Corps Reserve Training Center, Los Angeles, California, now transmits code practice



Corporal D. J. Gee, USMC, W7NCQ/6, chief operator of Fleet Marine Force, Pacific, amateur radio station KH6AJF, at the 20-meter operating position.

on 2356 kc on Monday evenings from 7:50 P.M. to 9:30 P.M. PST at speeds commencing at 5 w.p.m. and later increasing to 10 and 15 w.p.m.

—···—

Naval Reservists Howard V. Johnson, K6CRO, Dean F. Babcock, W6OEB, and Carl J. Knauff, W6TJD, are active operators at K6NR, Naval and Marine Corps Reserve Training Center, Los Angeles, California.

—···—

Amateur radio station K6NCB of the District Naval Reserve Electronics Program Office, 11th Naval District Headquarters, is operated by K6DY, W6BMX, W6PXW and W6WOY, all Naval Reservists.

OPPORTUNITY FOR LARGE EARNINGS

Sales engineers wanted to actually demonstrate with antenna trailer the new patented rotorless, all direction, all channel, UHF-VHF TV and FM antenna. Limited traveling. Send resume to:

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70-07 Queens Blvd. Woodside 77, New York

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 19 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $1.50. Mrs. Earl Mead, Huntley, Montana.

QSL's-SWL's Meade W9KXL, 1507 Central Avenue, Kansas City, Kans.

WANTED: Cash or trade, fixed frequency receivers 28-42 Mc. W9YIV, Troy, Ill.

QSLS, SWLS. High quality. Reasonable prices. Free samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 908 Hickory St., Arlington, N. J.

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QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢, with catalogue, 25¢.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

QSLS. Custom-made or stock! State which. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Illinois.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey-Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples 10¢.

QSLS-SWLS, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50, General, $1.75, Amateur Extra, $2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

CALL Letters, 25 cents a set. Dress up your rig, car, etc. For samples, write to Robert Connick, Nickson, P.O. Box 272, Cincinnati 1, Ohio.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, power supplies, miscellaneous gear and parts. What have you? Please state price desired. Harold Schonwald, W5ZZ, 718 N. Broadway, Oklahoma City, Okla.

QSLS. Taprint, 205 South, Union, Miss.

MICHIGAN Hams! Amateur supplies. Store hours 0800 to 1800 Monday through Saturday. Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Phones 8696 and 8262. Roy J. Purchase, W8RP-Leroy Reichenberger, W8LJD-Edmund E. Gunther, Jr., W8HMW.

SELL: 75-watt 80 cw xmitter in metal cabinet. Illustrated 1952 ARRL Handbook), $55.00. W9KC, J. Veutter, 1312 Fillmore, Alexandria, Minn.

FOR sale: Late model Johnson Viking I, de-EVE'd, tubes, low pass filter, many extras, new Hallicrafters SX-71 and speaker, new Meissner signal shifter. All of this equipment is in excellent operating condition and will be sold to the highest bidder. P.o.b. Chappell. Write Larry Pyle, W9AGE, Chappell, Nebraska.

QSLS! We've printed a million for hams all over the world. Samples 10¢, refunded. VVS Print, 1704 Hale, Ft. Wayne, Ind.

QSLS! SWLS. DX specials! One-day service! Finest and largest variety QSL samples 25¢. Sakkers, W8DEH, Holland, Mich.

POST CARD brings you free information on our new Amateur Desk Sights and money saving club purchase plan. Hawkins Distributing Co., Panjabrick Terr., East Moriches, N. Y.

WANTED: AN-ARI-1 transmitter and/or parts. Robert Wegelin, 410 Cedar Street, NW, Washington, D. C.

QSLS-SWLS. Battinoski, W1VHD, Box 617, Houlton, Maine.

QSLS. High quality samples 10¢. Dortch, W4BDF, Jocelyn Hollow Rd., Nashville, Tenn.

QSLS. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Fanwood, N. J.

CALL signs, aluminum, reflecting type, car, rig, home. Regular 2" x 5", $1.50; Jumbo 4½" x 12", $2. Satisfaction guaranteed. Overnight service. J. Q. Whitley, W2LPG, 143 Airedale Ave., Long Branch, N. J.

NEED: NC-348 and BC-342 radio receivers. C. Hoffman, 1406 G St., N.W., Washington, D. C.

ANTENNAS. Specializing exclusively in amateur antennas. Green's dipoles and 20-meter Panther beams. Send for flier. Antenna, Inc., Wakefield, R. I.

ELECTRONIC Technicians. For permanent positions with Sandia Corporation. Armed Forces acquired radar or electronic experience desirable; trade school certificate with minimum five years experience. Versatility, capability and willingness to work most essential. Sandia Corporation, a subsidiary of the Western Electric Company, operates the Laboratory under contract with the Atomic Energy Commission in Albuquerque, New Mexico. Excellent working conditions and liberal employee benefits, including paid vacations, sickness benefits, group life insurance and a contributory retirement plan. No housing shortage in the Albuquerque area. For further information write to Section 42, General Employment Division, Sandia Corporation, Sandia Base, Albuquerque, New Mexico.

VHF 152 $40; BC-453, $18. Mullen exciter, four sets of coils, $25. Meissner Deluxe Signal Shifter, five sets of coils, $35. All units complete with tubes. Wayland M. Groves, W5NW, Box 586, Odessa, Texas.

QSLS! SWLS! See the latest, most striking designs. Free samples. This ad worth $1 with order. Acme Printers, 707 W. 8th, Los Angeles 17, Calif.

VERY sweet baby mobile antenna satisfies XYL mobile antenna problem. Beautifully chromed only 4 feet high. High Q weatherproof plug in loading coils. Changes bands instantly. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for Gonset, Elmac, Viking, 6-meter mobile transmitters. Tiny but effective on all bands. Replaces regular cowl or fender broadcast whip. Easily installed in a few minutes. Coils available 75 through 10 meters. With mounting hardware and one coil, $12.95 each. Specify band. Other coils, $2.25 each. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

FOR sale: 250-watt NBFM cw trans. rack panel mounted in 16" metal cabinet. H. V. supply on separate chassis. Sonar X-10 T-19-ARC-5 VFO, SX-24 with speaker. Reasonable. W2DVH, 60-71 70 St., Maspeth 78, L. I., N. Y. Tel. Hickory 6-6375.

WANT: AN/ARC-1's, AN/ARC-2's, BC-610E's and components. Write to B. Spivey, 2013 Rolling Road, Chevy Chase, Md.

QSLS. Quality with economy. Samples 10¢. Stinnette, W4AVV, P. O. Box 155, Umatilla, Fla.

JUST out! 1954 Edition World Radio Handbook — only complete survey international broadcasting. $1.50. DX'ers — Ham's interpreter, words and phrases in seven languages — $1.00. World Radio, 47 Mounthaven Drive, Livingston, N. J.

QSLS! "America's First Choice!" Samples 10¢. Tooker Press, Lakehurst, New Jersey.

DX LOG of awards, the information you have been looking for. Contains the official rules for more than 30 awards with check lists to record your progress. DXCC covers nine pages alone. Only one non-DX award, WAS, which has space for five bands. Contains also postal data, countries cross index, list of banned countries and other valuable information. The prepaid price to any country is only one dollar, U. S. funds. By air mail to U. S. and possessions $1.25. Send check or cash now to: E. C. Frierson, W4RKJ, Hobby Publishing Co., Easley, S. C.

WANTED: IRE and QST, 1925 through 1933; BSTJ up through 1946, April 1948, April 1951; RCA Review June 1947. George Maki, W6BE, 1417 Pacific, Santa Barbara, Calif.

SURPLUS specials! RG-8/U Cable 100 ft. $5.95, 250 ft. $13.25, 500 ft. $25.00. Coaxial Connectors — PL-259 5 for $2.25, SO-239 5 for $2.00. New tubes — 807 — $1.65, 811A — $4.25, 812A — $4.50, 813 — $10.50, 866A — $1.48, 304TH — $8.75, 872A — $14.95, 249C — $1.85. Postage extra. Request free bulletin and visit our new store for thousands of bargains. Want to buy or swap: Selsyns, Synchros, Servo Motors, Amplidynes, RCA-1B Aircraft Radio. Lectronic Research, 719 Arch St., Philadelphia 6, Pa.

QSLS. Something different! Send $1.00 for 100 and be surprised. 24-hour service. Satisfaction guaranteed or send 10¢ for samples. Constantine, Bladensburg, Maryland.

FOR sale: Collins 32V3 xmitter, 15C2 low pass filter, 75A2 receiver with NBFM adapter, 100 Kc. xtal calibrator, all A-1 shape. First $1000 takes all. Ken Ring, W8GVY, 249 E. Main Rd., Conneaut, Ohio.

CORRECTION: RK41 QZ tube, brand new, $17.50 postpaid. W5AXF.

FOR sale: HRO-50-T1, speaker, coils, A, B, C, D, E, F, calibrator, $275.00. Perfect condition, used by SWL. John Champlin, Little Valley, N. Y.

SURPLUS bargains. New oil filled condensers 2μ 600VDC 60¢ — 4μ 600VDC $1.65 — 6μ 400VDC 85¢ — 8μ 600VDC $1.85 — 4μ 1000VDC $1.59 — 12μ 2000VDC $8.95 — 2μ 4000VDC $7.95. 200 asst. ½ watt resistors, all insulated $2.50. Postage extra. Request bargain bulletin. Reliance Merchandising Co., 2215 Arch St., Philadelphia 3, Pa.

SX-24 and Spkr $200; HT-18 5 band AM-FM VFO $75.; HFS with new pwr supply $125. All in new condition. ARC-5 receiver with tubes 6 coils and 522 transmitter less tubes $25.00 for both. Harrison antenna tuner with all coils $15. Want SX-42. John A. Schwertel, W2HDR, 111 West Hoffman Ave., Lindenhurst, L. I., N. Y.

FOR sale, BC348 receiver, extra audio stage, S meter and noise limiter, balanced ant. input and Ant. trimmer in new condition $65.00.

BALLARD Constant "Watered" Ground gives constant loading all seasons. Most satisfactory when radials are impossible. Improves all station operation. 48" long, ¾" heavily galvanized, after drilling, holes 1½" apart, cast pointer for easy driving, filled crushed stone, brass hose connector, and cap for driving. $5.00 express prepaid U. S. A. W5CLH B and B Specialty Company, 1718 Hawthorne, Houston, Texas. Patent Pending.

VIKING II Transmitter for sale. Rochel, Rt. #2, Box 177B-3, Bartlesville, Oklahoma.

TRADE stamp collection for radio gear. Sell Triumph 5" scope, 4 x 150 A tube. College, W5SHP, J. A. Herb.

DAYTON Hamvention is the best treat in ham radio. See Hamfest Calendar this issue.

HALLICRAFTER receivers, new. Each one rechecked for calibration and peaked for top performance before shipment. Cash or trade, best deals. Edson Electronic Co., Temple, Texas.

QSLS — Quality at reasonable prices. Samples 10¢ refunded. Joe Harms, W2JME, 225 Maple Ave., North Plainfield, N. J.

FL 8 FILTERS, two for $2.50 prepaid, with PL 55 and JK 26 attached two for $3.00 prepaid. Extra PL 55 & JK 26, 25¢ each. Converted prop pitch motor $15.00. Small antenna rotator for 10 M beam or TV antenna with 28V DC supply $10.00. BC 348 shock mounts $2.00 ea. Sola type 30726 constant voltage xfmr 80 V.A. $15.00. Autoformer 10KVA $10.00. New Amatran plate xfmr 1560 VCT at 500 MA, $15.00. Anchor model #ARC-101-100 2 stage cascade TV Booster, $15.00. 55 Watt Thordarson T-30W55 public address amplifier, perfection condition, $65.00. APS-13 402MC transceiver with R.F. heads, $4.00 ea. M. D. Hames, W5QCB, 1316 S.W. Military Drive, San Antonio 4, Texas.

WANTED: Hallicrafter ARR7 receiver 28 volt version of SX25. H. L. Griffiths, W2OQR, 99-82 65 Place, Woodside 77, L. I., N. Y.

HARVEY-WELLS TBS-50C, with AC power supply, coaxial antenna relay and carbon microphone, all like new, $125.00; Gonset Super Six converter, $47.00; Electro-voice 600C dynamic microphone, $10.00; 0-100 R.F. Milliammeter; 0-8 R.F. Milliammeter; 0-30 D.C. Voltmeter; 0-100 D.C. Milliammeter, $5.00 each. Write Ed Matthews, W4ZMZ, 1570 Lee Street, Charleston, West Virginia.

FOR Sale: Eico VTVM, $40.00. Send card for list of gear for sale or trade. W3PKI, 737 Pine St., Steelton, Pa.

S76 Hallicrafters Receiver, almost new, perfect condition, original carton, $150. Freight collect. L. D. Hamilton, W3WEK, Salisbury, Maryland.

QSL Cards $1 per 100 — See "Old Rubes" miniatures, $1.35 — stamp for samples. Old Rube, W6HTN, Route 1, Box 34, Del Mar, California.

WE are now in our new ultra modern building with fresh stocks to serve you. Bargains. Extra Special: Motorola P-69 series Mobile receiver, $19.50; Gonset 10-11 converter, $19.95, DM-36-10 meter converter, $19.50, VHF-152, $49.00; Breting 12, $49.50, HF-10-20, $59.00; S-40A, $75.00; RME-45, $99.00; RME 2-11, $99.50; HRO Senior, $99.00; SX-43, $119.00; S-76, $149.00; SX-71, $169.00; SX-42, $189.00; HRO-50, $275.00; 75A1, $275.00; MB611 Mobile transmitters, $14.95; 90800 exciter, $22.50; HT-17, $12.50; EX Shifter, $69.50; Globe Trotter, $69.50; TBS-50D, $99.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $225.00; Globe King, $295.00. We need used receivers: We give highest allowances for S-20R; S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X, and similar receivers. Free trial. Terms finance by Leo, W9GFQ. Write for catalog and best deals to World Radio Laboratories, 3415-27 W. Bway, Council Bluffs, Iowa.

FOR sale: Gonset Tri Band Converter in like-new condition. Has been used very little. $30.00. W. M. Jackson, W4ILZ, Box 51, Savannah, Tennessee.

NOVICE crystals — 80, 40, and 15 meter — $2.75, 2 meter, $3.50. New, plated, and hermetically sealed ½ in. pin spacing. Within 3 KC of requested frequency on fundamental. McNay Crystal Labs., W8ELB, 644 Probasco St., Cincinnati 20, Ohio.

TRADE: Have BC-522, HT-6, four command receivers, with one triple rack, Kaar mobile transmitter, Gonset, 5-50 converter. Want Harvey Wells TBS-50, test equipment. All letters answered. Elmer A. Searle, Gen. Del., Moses Lake, Wash.

NEED: R5A/ARN-7 Bendix compass receiver and BC788 altimeter; BC-348 Receiver and parts; Advise at once price, condition. Also buyer of all surplus aircraft electronics. Write James S. Spivey, Inc., 1406 G St., N.W., Washington 5, D. C.

PASS amateur theory exams. Check yourself with sample FCC-type questions and Novice and General class examinations. All for only 50¢. Aurora Electronics, 1203 Bryant Ave., New York 59, N. Y.

IF I were interested in buying anything in the ham game I'd try Uncle Dave, W2APF, first, at Fort Orange Radio Distributing Co., Albany, N. Y.

FOR sale: transmitter 50 watts cw, 40 watts phone. TVI proofed complete with modulator, power supply, all coils. Bud low pass filter, and Lysco antenna tuner, $135.00. W5WXJ. 624 13th Ave. N., Texas City, Texas.

PHOTOSTAMPS for QSL's — Send any size photo or negative (returned unharmed). Sheet of 100 glossy photographs, perforated, gummed. Stamp size, $1.50, double size, $3.00. W6MEP, Agnes Langevin, P. O. Box 14001, Los Angeles 49, Calif.

WANTED: All Riders or Photofacts since 1950. Roxy Service, Mitchell, S. D.

IT all goes except the Mobile. One 10-A exciter, VFO & Q1-1. SX43 receiver, 807-175 watt liner, one 304TL kw liner. Also several 1000-ft rolls of No. 10 copper weld ant. wire @$7.50. Write Joe Brickner, Halsey, Nebr.

QSLS SWLS; reply quality, ham stationery. Samples dime, write, Printcraft, Box 387, Waurika, Oklahoma.

HEATH; TS-2 TV sig. gen. new, $40.00; NRI communications course lessons, answers, kits, complete, $75.00; 829B new, $6.00. Brown Taylor, 1307 Vultee Blvd., Nashville, Tenn.

TRANSMITTER bargain 500 watts phone and CW, $175.00. Cash & Carry, W8WBG, Detroit. Details call Tyler 4-2704.

10, 15 & 20 Meter beams, Aluminum Tubing, etc. Perforated Aluminum Sheet for shielding. Radcliff's, Fostoria, Ohio.

FOR Sale: BC-148 transmitter receiver, excellent condition. Best offer accepted. KN6CLL, Box 425, Dinuba, California.

WANTED: ART-13, TCS, BC-348, SX-71, NC-173, HQ-129X, etc. Farr Electronics, Box 273, Lexington 73, Mass.

USED and new ham receivers and transmitters, bought and sold. Best prices. Olson, Box 4, Kearney, Nebr.

GONSET two-meter converters, $24.95; 10-11 converters, $24.95; RME MC-H4 converters, $39.95; Sonar MR-3 mobile receivers, $39.95; Eldico TR75 transmitters, $39.95; Meissner EX signal shifters, $39.95; many other used items; ask for latest list of receivers, transmitters, test equipment, etc. We trade and offer time payments. Also handle all leading brands of new equipment. Contact Carl Evans, W1BPT at Evans Radio, Concord, N. H.

FOR Sale: National HRO 60 and speaker, Coils A, B, C & D. Brand new, $400. No shipping. H. W. Braker, 160 Glentay Road, Lansdowne, Pa.

800 WATT deluxe phone transmitter with 2 VFO's and 2 PP810 finals. Either 80 and 20 or 40 and 20. 805 modulators. One switch to change bands. All circuits metered. Both overload and underload protected. Best of parts. TVI suppressed. 100% tube replacement. 3E close spaced beam. Best offer over $400. Orson Curtis, W8JSK, 855 Woodworth Rd., Jackson, Mich.

VIKING I, excellent condition, Viking VFO, all tubes and new spare 4D32, $260.00, Stancor S1203A, converted 75, $40.00; Gonset 3-30 and noise clipper, $30.00; Dynamotor, 6v—425v @ 375 ma $30.00. Standish, W7PHA, Big Timber, Montana.

FOR Sale: BC-611-E complete with speech amplifier, coils and tuning units 10 through 80 meters. No. 1 V.I. Will crate and ship. Also BC-348 for 110 a.c. and Bendix TA-6 (12v) and RA-10 (12-24v) with cables, plugs, tuning head, etc. W4ZAV, J. E. "Doc" Reed, Box 1071, Gastonia, North Carolina.

LYSCO 600S still in shipping carton — sell for highest cash offer or trade for good TV or what have you. W8LZD, 712 N. Downing St., Piqua, Ohio.

FOR sale: Navy Surplus TBK transmitter, 2000 to 18,000 k.c. VFO. Uses 861 in final, rated well over a kw. Vt or relay keying 12 meters used, built in antenna tuner. Will trade for Collins 32V2 or $450, cash. Photographs and other information available. Also new model 26 teletype machine and converter with built-in scope, perfect working condition on the air now. Will trade for Collins 75A2 or sell for $900.00. Wendell Motter, St. George, Utah.

WILL trade 17" Emerson or 17" Halli. TV set. Excel. cond. for good rcvr or xmtr. Write Stan Phillips, 6004 Sarvis Ave., Riverdale, Md.

SELL: RME-70 with speaker, $65.00. Meissner Deluxe sig. shifter, 3 set coils, $25.00. Millen grid dip with coils, $40.00. Archie Foster, Colton, N. Y.

SAVE $75.00: Almost new SX-62 Hallicrafters SW Receiver with matching speaker offered for $900.00. Guaranteed in perfect condition. Shipped prepaid. Write Mr. Gerald Bunker, Kent School, Kent, Conn.

VHF 152A, $50.00; Hickok 288X Signal Generator, $90.00, FOB. W4NI, 3600 Old Vineyard Road, Winston-Salem, N. C.

POWER supply 600v. 300ma, relay, quality components, with 8¾" rack panel, $25.00. Cabinet rack 17½" panel, top and back door, condition, fair, $8.00. Webster mod 56 changer, perfect. Make offer. All plus shipment. J. D. Rule, W4PWL/1, R.f.d 1, Harrison Ave., East Greenwich, R. I.

ELDICO 60 Watts, 80m, 10m. TVI-proof, like new. Plus Bud VFO, $50.00. George Paules, W2DTI, 251 Sherman Ave., N. Y. C. 34.

MOBILE operating station for sale. Bandswitching 10-watt 5-through-160 transmitter (6N7 modulates 5763); Morrow 75-20-10 converter, Philco 9-tube radio, TNS noise suppressor, Mallory 200ma Vibrapack, Dash control unit, Panel meter (S-meter, modulation, crystal and band indicator), RCA microphone. All plug-in, relay-controlled. E. S. Winlund (W1KIJ), 80 Timber Trail, Wethersfield, Conn.

BARGAIN priced: Meissner EX Shifter with FMX modulator, $45.00. Heath Signal Tracer Kit, $10.00, new unconverted BC-455B, $7.00. All FOB Cleveland. W8SQS, 3826 Strandhill, Cleveland, Ohio.

SELL — Trade: 5 Vibrapacks 150 v. 90 Ma. $10.00 each, 40 watt modulator, $20.00; converter 6 v.–110 v. AC 60 cycles, $20.00; cradle telephone set, $7.00; 3 Novice xmitters, $15–20.00 and $35.00; ¼" electric drill, $12.00; new BC-1006, battery phone intercom set, $7.00; 100 feet 52 ohm amphenol (beaded) coax, $8.00; 17" TV enlarging lens, transformerless (selenium) supply — 330 v.–200 Ma., $8.00; 2 new 15 pound spools of magnet wire, size 22 and 25, $10.00 each. NEED: — Simpson 260 V.O.M., D104 mike, grid-dipper, or??? W8QKU, 2748 Meade St., Detroit 12, Mich.

SELL: pair B & W Balun coils with chassis and ant. relay, $6.00; Heath SG-6 signal generator, A-1, $11.00. W2HFM, 60 Lindgren, Merrick, N. Y.

SURPLUS Electronics, send for list. BC455 receiver's 6-9MC, new, $10.95, plus postage. Tuning crank for above, 65¢ postpaid. Steigers, W7FVO, Rt. 5, Box 748, Tacoma, Wash.

FOR Sale: RT Model 12 Teletype Printer with synchro. motor, works very good. Price, $100.00. Will crate and send collect. J. Peoples, 4989 Terracite Lane, La Canada, Calif.

FOR sale: HQ129X W/freq. std., $125.00, RME MC-55 converter, $45.00; Sonar XE10 FM exciter, $20.00. J. McKee, 45-22, 39 Place, L. I. C., 4, N. Y.

SELL: Morrow 5BR converter, $55.00. W9RVN, 3032 E. 80th Street, Chicago, Ill.

ELMAC A-54 transmitter, $110.00; Gonset Commander, mobile trans. and VFO, $90.00; Gonset Super Six mobile converter, $35.00. Gonset 262KC QSer, $20.00. R. Van, 412 Humboldt St., Rochester 10, N. Y.

FOR Sale: All 1951 production, Hammarlund HQ129X, $199.50, RME HF10-20, $92.00, Sideband Shcer "A", $74.50. All for $200.00. Reason for sale: bought a SX88. W9KPD, Wm. F. Frankart, 1259 S. Boeger Avenue, Westchester, Illinois.

WANTED: Any complete and perfect, or complete and excellent membership copies of *QST* published in period 1919 to 1925, inclusive. These contain Operating or Traffic Department Reports. Also want Special League Bulletin published May, 1919, entitled "Getting Together Again," sometimes called "Midget Issue of *QST*." Sumner B. Young, W@CO, R.R. 3, Box 94, Wayzata, Minn.

FOR Sale: National HRO (RAS-2) Navy model, all coils, power supply, speaker, coil cabinet, all mounted in table rack. Also RME VHF-152A Converter. Both for $125.00, plus shipping, or will sell separately. Photo sent upon request. R. Minichello, 1101 W. Hubert, Las Cruces, N. M.

NECKTIES: Your handle and call handpainted in contrasting colors on rayon satin, $1.25, Nyon Acetate, $1.75, Pure silk, $4.75. Red, Maroon, Brown, Gray, Yellow, Green, Black, or Royal, Powder or Navy Blue. No C.O.D.'s; prepaid. Henry Schanding, W4RRF, Harrington, Delaware.

SELL: BC-406 — 2 meter 15 tube receiver. AC power supply. 2ER-4IF stages, $16.00. Knight VTVM, $17.00. 20 watt, 10 meter phone transmitter. T17B mike, 2E26 final, AC power supply, $30.00. W@GSV, 798 Sherburne, St. Paul, Minnesota.

BEST offer takes AN/APT5 with spare 3C22. Misc. lighthouses and klystrons. ASB and other gear for 400 Mc. up to K band. Novice receiver and many other small odds and ends. Old *QST* back to 1920. Write for list. Want *QST* before 1920, Westinghouse panel meters, AX9903, 4X150A, 4-65A, 6A34, 220 and 420 mc. gear. W9UFB, 2429 Smith St., Fort Wayne 5, Indiana.

WANTED: SX28, BC 221, microvolt signal generator post condition, O.K. if priced right. WN4CPO, W. S. Williams, 1273 North Parkway, Memphis, Tenn.

STOP paying so-called wholesale prices for off brand undated tubes. We can supply name brand dated tubes, RCA, GE, etc. at dealers' prices. Receiving transmitting and special purpose. Price list free. Write Hamtubes, Box 35, Ramsey, New Jersey.

FOR Sale: 32V-3. New condition, original packing case, with manual. $600.00. W8ZBD, 511 N. Warner, Bay City, Michigan.

FOR Sale — Viking I factory wired and Johnson VFO like new $250.00. Gonset Tri-band new $55.00; Mark II Tank set, dynamotor, rack, control box, cables, 2 antennas and mounts, mike and earphones new $60.00. K2DAQ SA-7 24/9, N. Y. C.

TELEVISION set suitable for monitor cheap. Want Multiphase or Eidico SSB Exciter. W4API, 1420 south Randolph, Arlington, Va.

SELL: 800 watt phone transmitter W8PJP. 12717 Irvington Ave., Cleveland, O.

SELL or swap: Fifty transformers and chokes. Thirty oil filled condensers. Forty transmitting tubes. Two 20KV-50mmfd vacuum condensers. Meters. 6 volt dynamotor. 35 mm. camera, projector and screen. New 8 power binoculars. Misc. items all bargain priced. Free list. Want R9er. WØZOJS, Box 273, Coleraine, Minn.

FOR Sale: SX28 with speaker, $95.00; Rcvr. from 522 with tubes unaltered $12.50, 2 meter ARC 5 unaltered $22.50; BC459 modified with regulation $20.00; Pilot tuner I-601 — $15.00. Postage or express collect? Henry Mohr, KL7AQC/W3, 1005 Wyoming St., Allentown, Pa.

FOR Sale — 500 volt, 200 ma., metered power supply. Also tubes, xtals, and parts. Write for details Peter Bottorff, 812 Lloyd Place, Winnetka, Ill.

FOR Sale: Complete all band station noTVI 100 to 500 watt pr. HK 257 B& 6-foot enclosed rack, 5 meters ant, tuner also HT18 RME rcv., 2 spkrs., mike, worth $1200.00 Take $475.00 cash. D. Bumington, W6AJH, 1125 Arrowhead Ave., San Bernardino, Calif.

VAN SICKLE is the place to buy new or used equipment. Johnson-Viking, Eidico and Sonar Wired or Kits in stock. Big Trades. Easy Terms. W9KJF, 1320 Calhoun St., Ft. Wayne, Ind.

SELL: Eico tube tester #625 — $25.00, signal generator #320 — factory tested, $20.00, 500ma. choke $10.00, 20-UL coil — $2.00, condensers; 1 MC $1.00, National, new — $3.50; Cardwell XP200KS $5.00. Gerard Moor, W1OGY, 53 Garland Ave., Cranston 10, R. I.

SELLING complete ham station. Write Clinton Vaughan — Dysart, Iowa.

TRANSVISION, "Commander," Receiver, British made, dual conversion, like new, $165.00 (list $279.50); 5 Mc Panadapter, 100 kC sweep, minus case, $25; New Drake R-1B/U low pass filter, $5.00, New PE-101-C dynamotor, $5.50. W1KJO, 29 Pine St., Bedford, Mass.

ANTENNA tuner: Eldico 300 watt complete, plus built-in Advance 400 relay, shielded link, and coils for 40, 20, 15. Like new, $35.00 or best offer. Robert Bonebrake, 3027 Memphis, El Paso, Texas.

FOR sale: Hallicrafters S-40B $60.00, Instructograph 110 volt model with 10 tapes and instruction manual $30.00. W4PNF, 760 Poole Drive, Fayetteville, N. C.

SELL: Meissner sig. shifter, EX, $15.00, Eldico ant. tuner, 10, 20, 40 mtr. coils $25.00. W2ZDQ, 8 Tessen St., Teaneck, N. J.

WANTED: Early wireless gear, books, magazines and catalogs before 1925. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

WILL pay $20.00 each for GE Selsyns 60 cycle types 2JDSHAI, 5C-1, 5DG or any size 1. Other types will advise. Subject to our inspection; delivered in Boston. Electro, 50 Eastern Ave., Boston 13.

AMPRO Tape Recorder Model 731 less mike $50.00. Hallicrafters S19R Receiver $25.00. Hoteld, W9VVX, 3626 East 34th Street, Indianapolis 18, Indiana.

SELL: Heathkit AR-2 communications receiver with cabinet. New condition, used five months. $45.00. WØOMX, Donald Schmidt, Canton, Kansas.

SALE: 300 watt plate modulated transmitter. Bandswitching 80-10 with VFO completely shielded. Commercial appearance. Also HQ-129-X in good condition. Will deliver 50 mile radius. Earl Carlsten, W3KUC, 507 Margaret Dr., Silver Spring, Md.

PHILLY area: Harvey-Wells TBS50C w/a.c. pwr. supply, new condx, less than hour on air, $100.00, less pwr supply $65.00 — Simpson #240 Hammeter, perfect $15.00, both cash and carry. W. R. Chidlow W3IFS, 2009 Oakmont, Havertown, Penna.

FOR Sale: Viking II factory wired, VFO, TBS 50 D with a.c. power, HT-18, SX-28, Gonset Commander with VFO, KW mod. transformer, 50 w. speech amplifier, Onan 1 Kw generator, many parts. Write for information. W3VDE, R. R. Lamb, 1303 Yardley Road, Morrisville, Penna.

SELL: SX-71 and matching speaker, excellent condition. Complete $220.00. Gordon Reese, 47 St. Mary's Street, Yonkers, New York.

FOR Sale: Complete two meter station, consisting of: BC-522 transmitter, two tube converter, complete power supply, and antenna. $50.00. Robert Champin Jr., K2BKX, 131 Bryant Avenue, Springfield, N. J.

PAIR Elmac 250TH's, used less than 100 hours. Both for $25.00. W8QMN.

ELDICO 2 meter receiver, transmitter, and power supply $120.00, excellent cond. Novice code and theory course — $10.00. Carter 6 volt dynamotor, 600 v., 170 Ma. Out $15.00. Seymour Zaval, K2AWA, 292 Riverdale Ave., Bklyn, N. Y.

ELMAC A54H transmitter and PSA-500 Power Supply, used 10 hours, sacrifice both $425.00. SX-25 receiver, perfect, $75.00. R. Cozens, WØDWE, 1037 8th Street, Boulder, Colorado.

SELL: HQ-129X, 200 watt transmitter HT18, 807 buffer pair 812's final. Plate modulated 809's. 400 watts input with minor changes, partially TVI'd make offer. Robert Trostle, West Grove, Pa.

TRANSFORMERS, motors, generators, rebuilt, and wiring of electronic equipment. E. W. Barley W1YYX, 73 Willington Avenue, Stafford Springs, Conn.

FOR sale: 310-B1 Collins exciter $200.00. Harvey-Wells TBS-50D screened, W9DBM filtered plus pwr. supply, $125.00. No shipping, pick up and see, all new condition. W2WDT, Tel. GL3-1929.

WANTED: MM2 micromatch also National crysta calibrator XCU-5-9-2, W3BFF.

SELL Hammarlund Comet Pro receiver coils 20-160 meters speaker instruction $25.00, f.o.b. W3RNV, 2904 Newcastle Ave., Silver Springs, Md.

SELL: 400w all band CW FM tr ns nitter. Custom built. Finest components. HT-18 VFO, exciter, PP-813S. Fully metered, matched antenna coupler, #28 enclosed cabinet. 500W 1750v & 200W. 480v dual supply, 2 meter super. W2DTV.

4E27A (5-125B) & 4-125A used but guaranteed, $9.00 each. F.O.B. W2JME.

FOR sale: HT18 Hallicrafter VFO & NBFM, perfect condition with instruction manual. Ideal VFO & driver for H.P. Final price $70.00. W9PFW, 1220 Westview Rd., Glenview, Ill.

FOR sale: Gonset Communicator, like new, $185.00. Hickock 195B $95.00. Want Viking II. Drake, 4115 Slater Ave., Baltimore 6, Md.

SELL: Collins 32V2 with mike, low passfilter, $475.00; Elmac PMR6A mobile receiver, $110.00, with home-built power supply, $125.00; Sonar MR-3 mobile receiver $45.00; Stancor ST20A transmitter, $40.00; Stancor C1415 filter choke, 6 hy. at 500 ma., in original shipping case, $20.00, UTC S-44 plate transformer, 525 or 525 volts at 500 ma. unused, $12.00. C. Lindemann, W1MLM, Wilton Road, Westport, Conn.

CLASS "B" modulator, 805s. Rack panel construction. Has Kenyon TA70, Thordarson T62D65 and T64P14. Good condition. Trade for good panadapter or BC 221 with book or sell. W1AIJ.

BEST buy of 1954. 75A2-3 factory converted $175.00 less speaker. Lampkin frequency meter type 105A. Covers all amateur bands up to 175 megs. $50.00. New Gonset super six converter and clipper $55.00. W4BMR, Box 792, Ft. Lauderdale, Fla.

WANTED: PR-15 receiver, W6PQQ, 421 "D" Ave., Coronado, Calif.

ELMAC A-54H and PMR6 A transmitter and receiver brand new in factory sealed cartons, also power supplies, terrific discount. Spring housecleaning, used Morrow 3 band, Stancor ST201A with VFO. Mac W4NJE, Box 246, Lewisburg, Tenn.

SELL: Dynamotors, 1 PE103 $25.00, 1-PE103 $22.50, 1 Bendix 6v in 225v out $10.00, 1 DM 42 12v in 500 and 1000v out $10.00, 1-PE94C $7.50. W4MVM, Molyneux, 8421 8th. Ave. No., Birmingham 6, Ala.

FOR Sale: 32V2. Has been commercially de-TVIed. $475.00. Box 33, Dyker Station, Brooklyn 28, N. Y.

DEFOREST tubes, QSTs, other magazines, technical books, etc. Mrs. Conrad Beardsley, 103 Wythburn Rd., So. Portland, Me.

CALL letters, in color, on modern clear or colored plastic stand, for desk or top of receiver. Please state preference of clear or colored stand and color of letters. Stand is 3" high and 9" long. Send $5.00 plus 25¢ for postage to Vair E. O. Co., Hartford 82, Mich.

FOR Sale: BC 454 Q-5'er — $15.00; BC 454, 80-meter receiver $12.00; BC 455, 40 meter receiver $10.00; BC 457A, 80 meter transmitter $14.00; power transformer, 800 volt d.c. at 750 m.a. — $8.00; power supply, complete mounted, unwired 800-900 volt d.c., 225 m.a. complete with 816 tubes, sockets, switches, etc., $20.00; RG-8 U coax cable, 8 cents per foot, sell 100 foot lengths or 500 foot coil; Ground station transmitter for private airplane frequency (122.8 Mc.), modified ARC4 complete with preamplifier, external power supply. 832 final. Quickly changed to 2 meters. Two channel receiver, directions to make tunable, $65.00; Army surplus headphones, excellent, $2.00. Dr. Charles H. Scheifley, W9NOD, Mayo Clinic, Rochester, N. Y.

FOR Sale: Collins KW-1 in perfect condition & so guaranteed just like new, first $1000.00, F.o.b. Wakefield, R. I., Tel. Narra 3-4574 — WICFI.

SELL: Boehme automatic keyer, $95.00, Collins 30 J transmitter, $350.00. SX-71 receiver, $140.00, S-25 receiver, $49.00, teletype equipment, write for details. Want Collins exciter 310, AR-88, ART-13, BC-348 R, DY-17, BC-610, TCS, APN-9. Sig catalogs, technical manuals, panadaptor. Will trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

TOP cash for your HQ129X. Electronic Labs, 2444 "D", Lincoln, Nebr.

FOR Sale: brand new Collins 75 A2 never used, $375.00. 50 amp. Delco generator, brand new regulator, low speed cut in. $25.00 W9LQI, Ashton, Ill.

FOR Sale: Collins 32V3 with 55C-2 Low Pass Filter, $675.00; RME 45 with matching speaker, $80.00; Simpson Model 260 VOM, $20.00. All in excellent condition. C. L. Gonnel, WSBZW, Box 146, Killeen, Texas.

SELL — station W6ETR — complete — SX28A TBS 50D — Best offer accepted, write: K. R. Gee, Box 16845, Laurel Road, Los Gatos, Calif.

QSLs: 125, $2.00. Garra, Lehighton, Pa.

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SELL: NC-125 and speaker, top condition, recalibrated. Both for $145.00 or better offer. K2CIB, Frank Samuels, 39 Cambridge Rd., Scarsdale, N. Y.

QSL-SWL cards. Sensational offer, Bristol stock 500 1 color $3.95, 2 color $4.95, 1 color $5.95, super gloss $1.25 extra. Rainbow cards. Samples. Q-sl. press box 71, Passaic, N. J.

SSB FT-241-A crystals. Excellent quality for all SSB circuits $1.00 each, postpaid, "perfectionist" quality now $2.50 each. No additional cost for matched sets: six (Q-sl FT/50 pi), eight (Q-sl 8/51 p51), eight (CQ 4/51 pZ). All crystals guaranteed individually activity tested, calibrated, and marked exact true frequency in cycles. Inquiries invited; include stamp for dope sheets. Orco Products, Box 51, Downey, Calif.

WANTED: Any amateur or war surplus radio equipment in trade for new Johnson Viking, Hammarlund, National, Harvey Wells, Elmac, Gonset, Central Electronics, Hallicrafters, etc. Especially ART-13, DY-17, BC-348, BC-312, BC-342, BC-610, BC-728, BC-939, G/R-58, APN-9, Collins 310 exciter, 75A-1, 75A-2, 32V-1, 32V-2, 30-J, 30-K, panadaptors, manuals, teletype, Keyboard perforators. What have you to sell or trade? Allitronics, Box 19, Boston 1, Mass. Richmond 2-0048, 2-0916.

REAL bargains: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Meissner, Lysco, others. Reconditioned S-38 $29.00, S-40A $69.00, S-40B $79.00, SX-43 $99.00, S-76 $129.00, SX-71 $169.00, SW-54 $55.00, NC-57 $69.00, NC-57B $79.00, NC-125 $119.00, NC-183 $199.00, HRO-5011 $299.00, HRO-60 $399.00, VHF-152 $29.00, HF-10-20 $99.00, TBS-50C $79.00, TBS-50D $99.00, HQ129X, 75A1, 75A2, 32V1, 32V2, Viking I, Temco 75GA, HT9, many others. Shipped on approval. Easy terms. List free. Receivers rented. Write for details. Henry Radio, Butler, Mo.

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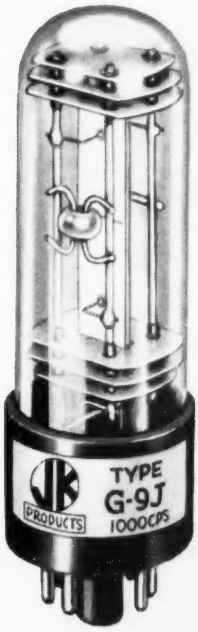

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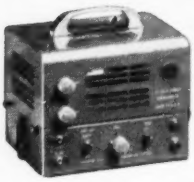

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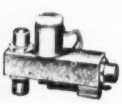

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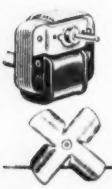
75 P 793. For 110 v. AC.....$10.50
75 P 797. For 6 v. DC.....$ 9.50
75 P 799. SPDT Switch.....$ 1.00



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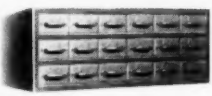

For storing small parts; each drawer with 2 adjustable dividers; with handle. Label holders on drawers and dividers. Heavy all-steel; olive-green. Drawer, 11⅞x5⅝x3⅛". Overall, 34x13¾x12"d. Easy to stack. Shpg. wt., 62 lbs.

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For operation on 75-40-20-15-11-10 meters with no external taps, projections or coils. Band change accomplished simply by raising or lowering top whip to precalibrated setting corresponding to band selected. Position of whip adjusts inductor to permit exact antenna resonance to be achieved anywhere in the band; minimizes loading problems; self-cleaning; top whip telescopes. Wt., 2 lbs.

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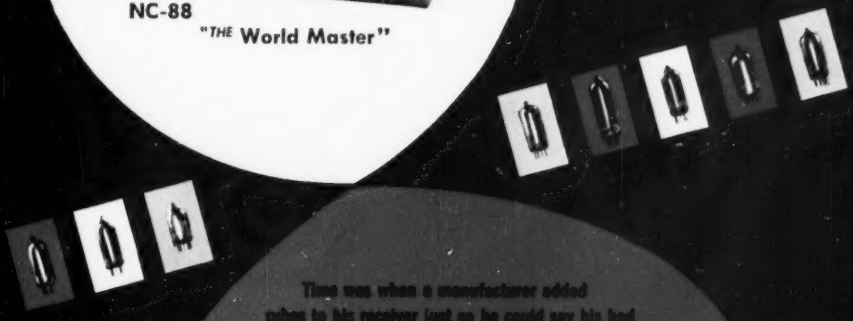

Time was when a manufacturer added tubes to his receiver just so he could say his had more than his competitor's. It didn't make any difference what these tubes did as long as he had more. This philosophy developed into the "Battle of the Bulbs."

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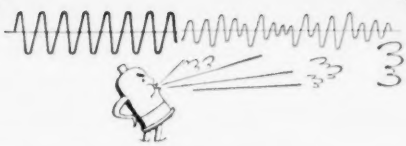

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120	2 RCA-807's	AB_2*	750	0.2
130	2 RCA-6146's	AB_2	750	0.4
340	2 RCA-811A's	B	1500	4.4
590	2 RCA-810's	B	2000	10
640	2 RCA-813's	AB_2	2500	0.4

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*Same output can be obtained, using special triode Class B connection and 5.3w driving power.

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